HUMAN COGNITIVE PROCESSING

Epistemic Modality, Language, and Conceptualization

Jan Nuyts

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Volume 5

Jan Nuyts

Epistemic Modality, Language, and Conceptualization

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A Cognitive-Pragmatic Perspective

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To the memory of Simon C. Dik
And to the memory of my father, Emiel Nuyts

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Transcription conventions in the experimental data

*	boundary of intonational unit
’	heavy stress (usually sentence accent) in spoken version, underscore in written version
/	pause
〈…〉	illegible, incomprehensible
[…]	remark by experimenter in spoken version, in written version remarks in the margins by the subject
~	word is not counted in word counts
_	to split words which are written in one but must be counted separately
!!!	separates separated parts of an answer in a reaction, if only the answer is provided

Preface

Any product of the mind is also the product of the society to which the mind belongs. This is obviously true for the present monograph as well, not only in the general sense that it is deeply influenced by the intellectual frames of mind in which I happen to have been immersed during my academic development, but also in many much more concrete ways.

Basic funding allowing me to do the present research has been provided by the Science Fund Flanders (FWO, formerly the Belgian National Science Fund) and by the Research Council of the University of Antwerp (Special Research Fund — BOF). In addition, I have benefitted greatly from visits at a few institutions. The basic ideas for this investigation have been conceived during a research stay at the University of California at Berkeley (Department of Linguistics) in Summer 1991 (sponsored by the FWO). Thanks to Eve Sweetser and Chuck Fillmore for hosting me. A considerable part of the research (especially the German data analysis) has been done while I was an Alexander von Humboldt fellow (awarded by the Alexander von Humboldt-Stiftung in Bonn) in the 'Sonderforschungsbereich 245: Sprache und Situation' at the University of Heidelberg, all through 1995 and the first half of 1996. Thanks to Christiane von Stutterheim and Wolfgang Klein for support. Last but not least, from 1993 onwards (and continuing), my affiliation as a research associate at the Max-Planck Institute for Psycholinguistics in Nijmegen has allowed me, in close collaboration with Wietske Vonk, to develop the experimental research program of which the results of the first major part are integrated here. These experiments were cosponsored by research grants from the FWO and the Research Council of the University of Antwerp, and (during 6 months in 1995) by a 'Eurostipendium' from the Alexander von Humboldt-Stiftung. Many thanks to Pim Levelt, Wolfgang Klein and Steve Levinson for their (very) long-term hospitality, and especially to Wietske Vonk for a most pleasant and stimulating working relationship.

Numerous people have contributed to a better understanding of some of the issues involved here, but I would particularly like to single out Johan van der Auwera, Marta Carretero, Dirk Geeraerts, Louis Goossens, Jiansheng Guo, Peter Harder, Kees Hengeveld, Wolfgang Klein, Ann De Roeck, Georges De Schutter, Eve Sweetser, Robert Van Valin, Co Vet and Wietske Vonk. Chapter 5 of this monograph in particular reports on research done jointly with Wietske Vonk (see Nuyts and Vonk 1999). Also thanks to two anonymous referees and the series editors Ray Gibbs and Marcelo Dascal for useful suggestions.

On the more practical side, I am grateful to my colleague Luc Vandenbosch for allowing me to use his corpus of Dutch, and to the Institut für deutsche Sprache in Mannheim for providing me access to their (online) corpora of German.

Some parts of this book build on work published earlier (cf. Nuyts 1993a, 1996b, 1998, 1999, 2000a, b, and Nuyts and Vonk 1999). Thanks to Mouton De Gruyter and Lincom Europa for permission to reuse materials published by them.

This book is devoted to the memory of two people who, in different ways, have been of enormous importance to me. It is devoted to the memory of Simon Dik, who died March 1st, 1995, while I was working on this monograph. I would like to acknowledge the strong influence he has had on nearly all of my work, including the present (even if our views differ in quite a few very substantial respects), and I will never forget the many stimulating hours of discussion as well as of pleasant leisure time we had on numerous occasions. It is equally devoted to the memory of my father, Emiel Nuyts, who died July 30th, 2000, when this book was in press. His role in making my work possible at all simply cannot be grasped in words.

Introduction

This monograph offers an in depth empirical investigation into the semantic domain of epistemic modality, i.e. a speaker's evaluation of the likelihood of a state of affairs, as expressed in language (e.g. "John is probably home"). And it uses this investigation to venture into the organization of the cognitive systems underlying language use, with focus on the relationship between linguistic and conceptual representation. As such, this investigation is meant as a case study to illustrate and further substantiate some views emerging from a cognitive-pragmatic approach to language (Nuyts 1992b).

Traditional linguistic research is still to a large extent characterized by an inclination to limit the scope of attention to purely linguistic aspects of language use, and to the organization of the linguistic system per se. Yet in reality language operates as an integral subpart of the human behavioral repertoire, serving a quite specific function in it. Hence, in a cognitive-pragmatic view, to understand (phenomena of) language use and the system behind it/them, it is essential to acknowledge the nature of language as a dynamic functional system serving and/or interacting intensively with other components of the human mind, and especially the central system of conceptualization. Correspondingly, it is essential to recognize that investigating language is necessarily part of an interdisciplinary enterprise of investigating the human mind, in which linguistics is but one player, albeit a potentially important one, if it accepts the rules of the game. For it can reach beyond linguistic structure and processing as such, into the depths of human conceptualization.

Epistemic modality is an excellent case to demonstrate these points. Epistemic expressions keep on evading linguists' grasp, due to their quite special and seemingly non-systematic characteristics, among others in terms of their semantic interaction with expressions of other qualificational categories such as evidentiality, negation, and time, and in terms of their

grammatical structure and their behavior in the range of semantic-syntactic dimensions such as questioning or conditionals. Now, most or all earlier empirical studies have dealt with epistemic modality as a, or one of the, semantic dimension(s) emerging in the course of the linguistic analysis of some structural category, usually the modal auxiliaries. Primary focus has thereby been on the structural rather than on the semantic category. Moreover, there has hardly been systematic concern with the full range of structural and functional dimensions of epistemic expressions in general, let alone with the question how these might correlate with the nature of epistemic modality as a semantic category.

Evaluating the likelihood of a state of affairs is not just a linguistic category, however. It relates directly to the way we perceive, memorize, and act in the physical and social world we live in. More specifically, it taps a crucial dimension of our mental activities, viz. our capacity to reflect on our knowledge and our reasoning with it, i.e. our capacity to metarepresent. As this investigation attempts to show, then, the structure and behavior of epistemic expressions reflects, hence can only be properly understood by reference to this conceptual status and its effect on the range of functional dimensions at play in these expressions' use. Vice versa, investigating those epistemic expressions and their functional structure offers evidence to improve our understanding of the role and position of epistemic modality and metarepresentation in conceptualization.

In the spirit of the cognitive-pragmatic view, then, the present study adopts a radical function-to-form approach to the matter: taking the semantic category as its starting point, it looks into the range of its linguistic manifestations. Epistemic modality is expressed through a variety of linguistic form types (within languages and cross-linguistically), and this investigation provides a comparative analysis of the functional and structural characteristics of four major ones, viz. modal sentence adverbs and predicative adjectives, mental state predicates, and modal auxiliaries. The purpose is to find out which general conceptual and communicative dimensions determine the speaker's expression of epistemic modality, and how these dimensions trigger the selection of specific form types and correlate with (hence can explain) their special semantic and grammatical features. Focus is primarily on Dutch and German, but with frequent reference to English also. The investigation is mainly based on corpus data, complemented with experimentally elicited and historical data.

This systematic comparative functional analysis of the paradigm of epistemic expressions not only allows us to improve our understanding of these expressions' linguistic behavior, however. It also offers an excellent basis to venture into what theoretical apparatus is needed to come to terms with the complexities of a category of this type. Due to the way it is conceived, the investigation allows us to trace the steps a speaker must take, hence to speculate about the cognitive systems and processes that must be at work when expressing an epistemic evaluation of a state of affairs. And it thereby offers an interesting perspective on the status of the semantic category, not only in linguistic structure and processing, but also in conceptual structure and processing. The background for this theoretical exploration is the concept of a language production model called 'Functional Procedural Grammar'. Central to the discussion is the notion of the 'layered representation' of qualificational categories as developed in a few functional grammar models.

This investigation, then, will first of all make a strong case for a radically non-linguistic view of conceptualization. The results of the empirical analysis offer a stringent argument for the assumption that epistemic modality as a semantic category is independent of its linguistic expressions. I will argue that this finding can be generalized to many other semantic domains, thereby developing a general view of the organization of the human conceptual system. In this light, the concept of layered representation and the position of epistemic modality in it is analyzed and developed, showing that the current narrow linguistic views on layering are insufficient or even inadequate from a cognitive perspective. The scope of this investigation is thereby extended beyond epistemic modality and its interaction with related qualificational dimensions as appearing from the empirical analysis, to cover the principles behind the qualification of states of affairs in general. It will be argued that layered representation, although it heavily determines linguistic structure, does not belong in the linguistic domain, but in conceptual structure. With special reference to the empirical findings regarding the functional dimensions determining the choice of epistemic expressions and their relation with the grammatical properties of those expressions, I will explore the principles of how linguistic representation and processing relate to the conceptual system. And I will develop a view of the how and why of the format and functioning of layering in conceptualization.

This monograph is organized as follows. Chapter 1 presents the preliminaries to the investigation. First of all, it introduces the cognitive-pragmatic perspective on language, as well as a few key principles of the concept of language emerging from it which will be central to this study, viz. ‘depth’ (concern with the wider cognitive embedding of language) and ‘dynamism’ (concern with the dynamics of linguistic behavior). In this light, it presents the case of epistemic modality and how it will be analyzed (the ‘paradigmatic approach’), and it offers a preliminary discussion of the major functional dimensions which will figure in the empirical analyses. Finally, it offers some principled and practical considerations on the data types and languages to be used, as well as factual information on the corpora which will be the most important source of data for this investigation.

Chapters 2 to 4 are concerned with a detailed scrutiny of corpus data for the four major expression types of epistemic modality in Dutch and German, with reference also to English, and with a discussion of issues regarding the linguistic characteristics of these expression types brought up in the literature (e.g., how to explain certain of their behavioral properties, matters of grammaticalization, etc.). Chapter 2 deals with the modal adverbs and adjectives, Chapter 3 with the mental state predicates, Chapter 4 with the modal auxiliaries. In each chapter, the first section will introduce some major linguistic (grammatical and lexical-semantic) characteristics of the expression types, and the following sections will show the way these form types behave in terms of the functional dimensions introduced in Chapter 1. Chapter 4 also contains a diachronic excursion. In these chapters, since the languages considered behave in quite comparable ways across the board, the analyses for all of them are presented in an integrated fashion.

Chapter 5 presents the results of an experimental investigation (performed jointly with Wietske Vonk from the Max-Planck Institute for Psycholinguistics) which throws an additional light on the role of information structure — one of the important factors in the use of epistemic expressions — in the different expression types.

The empirical Chapters 2 to 5 are primarily technical and descriptive in nature, as they mainly present quantitative and qualitative information pertaining to the functional analysis of the observed linguistic facts (though this will occasionally trigger discussion of issues preoccupying linguists in general). But in these chapters there will be very little discussion of wider theoretical issues. This is unavoidable: we must have a clear view of the

facts of language and the relevance of particular functional dimensions to understand them, before we can interpret the findings in terms of how they contribute to our notions of the cognitive infrastructure for language. And it is in the very essence of the paradigmatic approach that this view can only emerge from the analysis as a whole.

Chapter 6 is mainly devoted to the wider theoretical dimensions of the investigation. First of all, it sums up and adds some further perspectives to the analyses in Chapters 2 to 5, particularly by showing how one can (functionally) explain the systematicity observed in the grammatical behavior of the different expression types, and how this is reflected in their diachrony. This clears the floor for the theoretical analysis, which is initiated by introducing the 'tools' for the discussion: the outlines of the Functional Procedural Grammar view of language production, and a few current models of layered representation of qualificational categories as developed in functional grammar models (specifically, Role and Reference Grammar and Functional Grammar). With the help of these concepts, then, the remainder of the chapter develops the wider perspective on what our empirical observations mean in terms of modeling the cognitive organization of language processing and conceptualization, as outlined above.

Chapter 1

Preliminaries

1.1 The cognitive-pragmatic perspective

In most general terms, this monograph is an exploration into language from a cognitive-pragmatic perspective. As the term indicates, this view intends to take seriously two basic observations regarding the status of language (Nuyts 1992b).

The adjective 'cognitive' relates to the observation that language is a dimension of human mental activity. Language, like other complex behaviors, must be based on a sophisticated cognitive infrastructure, somehow implemented in the brain, allowing its production and interpretation. Therefore, investigating language, in linguistics or language psychology or whichever discipline, unavoidably means accounting for this cognitive infrastructure and the way it is anchored in the human mind.[1] And all sciences of language, including linguistics, necessarily belong under the umbrella of the

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1. Harder (1996: 56ff) takes my use of the notion of a 'cognitive infrastructure' (with specific reference to Nuyts 1992b) to imply that I hold a 'pancognitivist' view, i.e. a view in which there is no room for an external world and everything is considered to be inside the mind. This is a misunderstanding, however. I do not deny the existence or the relevance of an external world at all, on the contrary. And my use of the notion 'infrastructure' is intended to be completely theory-neutral, i.e. similarly as when one is referring to the infrastructure of an institution like a university, e.g. In the discussion, Harder refers to my view that social structure is entirely based on cognitive structure, and does not have an existence independent of the cognitive systems of the individuals constituting the social group. (Which also implies that cognition is a thoroughly social phenomenon.) This is a correct rendering of my position, and I fully stand to it. But this view in no way implies that there is no outer world, including other individuals with whom the cognitive system holds a social relationship (cf. the fact that I am referring, not to one single cognitive system, but to a set of cognitive systems constituting a group). For example, when I refer to the speaker's interlocutor (or to the hearer), I am not referring to some mystical apparition or a fata morgana in the speaker's mind, but to a real individual in flesh and blood out there in the world, as perceived and interpreted by the speaker.

cognitive sciences, and should thus bear all the implications of this fact, in terms of issues, methods and types of data to be accepted as relevant.

The adjective ‘pragmatic’, on the other hand, relates to the observation that, in the context of the human behavioral repertoire, language has a specific role to play, viz. (primarily) to allow communication with other members of the species.[2] Language is not the only type of human behavior which serves this purpose, but it is no doubt the most sophisticated one, at least in terms of the possibilities it offers for transmitting complex patterns of information. Hence, investigating language also unavoidably means accounting for how this system fulfills this communicative function.[3]

Neither of these contentions is extraordinary in itself, as they are both central to strong research traditions in the language sciences. But a systematic and full-scale combination of them into one research framework is much less common, and many researchers appear inclined to focus on just one of these dimensions. Thus, the cognitive architecture for language is not only in the province of language psychology and some parts of AI, but in the last decades increasingly also of linguistics. The analysis of how language achieves its functions does not figure prominently in most of this research, however. This does not necessarily mean that the relevance of the communicative dimension is denied. On the contrary, many cognitive researchers implicitly or (e.g. most or all Cognitive Linguists)[4] even explicitly adopt a functional view of language. But even then they often do not pay heed to the full complexity of the functional dimension of language and/or its consequences for theorizing, simply because this is not their prime concern. The functional organization of language, on the other hand, is a long-standing research concern in the functionalist tradition in linguistics and related fields

2. Language also has non-communicative uses, of course, but these may be considered secondary and derivative. See Grice (1969: 174ff), Searle (1972), Nuyts (1993b).

3. Thus, ‘pragmatic’ here refers to a (functional) perspective on language, not to a component of language besides syntax and semantics. The concept of a pragmatic component does not figure at all in the present framework. See Verschueren (1985), Nuyts (1992b: 64–71), Verschueren et al. (eds. 1995).

4. ‘Cognitive Linguistics’ will henceforth refer to the (originally Californian, though by now quite international) research tradition à la Talmy (1988a, 1988b), Langacker (1987) and Lakoff (1987). Non-capitalized ‘cognitive linguistics’ will stand for any type of linguistics concerned with the cognition of language, including the one represented in this monograph.

such as linguistic anthropology or ethnomethodology. But in this tradition there is fairly little explicit concern with the question what the functional use of language requires in terms of cognitive infrastructure. The different orientation of these traditions is manifest in the quite different nature of the theoretical models emerging from them.[5]

The cognitive and the pragmatic or functional dimensions of language are not just two separate issues, however. They are two faces of one phenomenon, which must be mutually interrelated and interdependent. The cognitive-pragmatic perspective takes this observation to heart: it assumes that an adequate account of language in general, or of any linguistic phenomenon in particular, has to do full justice to both dimensions simultaneously, in an integrative way. That is, understanding language means 'unearthing' the cognitive infrastructure responsible for producing and perceiving linguistic acts of communication. Ultimately, we do not need different theoretical models explaining different dimensions of this, but one model which coherently integrates both in one encompassing account. That is, ultimately, the functional and the cognitive traditions in language research will have to join hands and agree upon a common explanatory framework.

Of course, even as two faces of one phenomenon, the cognitive and the functional dimension have a different status in the investigation of language. The cognitive dimension is hidden in the black box of the human mind, and can only be accessed through observing what the system perceives and how it behaves (i.e. its in- and output). There is no direct way to observe the structures and processes inside the system which intervene between perception and behavior. The functional dimension of language, however, is part of the observable behavior. Just as one can observe the structural features of language in use, one can also observe (albeit less easily, because they are less 'material') the purposes for which these linguistic structures are used (i.e. communication as the overarching functional dimension, and the network of more specific functional dimensions supporting it, at many different levels of analysis — see Nuyts 1993b). Hence, analyzing the functional dimension of language is logically antecedent to analyzing the

5. These are trends, of course, and there are notable exceptions to them: e.g., Bruner (1990) and Clark (1992, 1996) on the cognitive side, or Givón (1990, 1995, 1998) and Chafe (1994) on the functionalist side, to name just a few.

cognitive infrastructure for language. In a cognitive-pragmatic perspective this also means, then, that the functional dimension of language has a crucial role to play in any attempt to uncover the cognitive dimension. To get a full-blown perspective on the latter, one cannot limit one's observations to the structure of the behavior, but one needs to take full account of (all aspects of) the functions to which these structures are put, hence of how form and function in linguistic behavior correlate. Hence the adjective 'pragmatic' also refers to the methodological dimension of investigating the cognitive domain: in cognitive research it is essential to use a radically functionalist methodology.[6]

It should be stressed that functionalism so defined does not involve dogmatic assumptions regarding the (cognitive) structure of language, contrary to the criticism often launched against it in formalist linguistics (and contrary to objections to functionalism in biology and the life sciences launched by some philosophers of science — see Nuyts 1992b: 64–83, 1995b). The fact that language is used for specific purposes (covered by the notion of communication) is a plain observation, and how this works in detail, also cognitively, is a purely empirical issue. Functionalism is a research strategy, a 'heuristic', which is limited by empirical facts. It perfectly allows for the possibility that features of language are non-functional, or functionally inadequate (admittedly, functionalists are sometimes inclined to forget this — see Givón 1995). Such features should even be expected, for at least two reasons: First, because structures unavoidably have their own inherent properties and once created (for some purpose) start to live a life of their own. Second, because language is a functionally complex system (communication is a multifaceted activity) and the many interacting dimensions are not always mutually compatible in terms of the requirements they impose on structure (Dik 1986). The present empirical case will provide a clear illustration of the latter point (see Section 6.1).

6. The present notion of functionalism, common in linguistics and most of language psychology, should obviously not be confused with the notion in cognitive psychology, involving the view that cognition can be studied independently of the neurophysiology of the brain (e.g., Fodor 1968; Johnson-Laird 1983). In essence I also subscribe to the latter view (see Nuyts 1992b: 7), and most cognitive research in linguistics and language psychology is in actual practice functionalist in this sense. But this matter is immaterial for the present purposes.

The basic purpose of this monograph, then, is to venture (building upon Nuyts 1992b) into what all of this actually means, by applying the cognitive-pragmatic perspective to the analysis of epistemic modality, and by using this analysis to advance our understanding of (some aspects of) the cognitive infrastructure responsible for language use.

1.2 The core issues: Depth and dynamism

The conceptual and terminological framework to be used in the present investigation has strong roots in the functionalist tradition in linguistics, as the paradigm which has gone furthest in analyzing linguistic structure from the perspective of its functionality. But due to its cognitive orientation the present approach also deviates substantially from some assumptions frequently encountered in the functionalist tradition, and brings up questions and views which are often more in the spirit of certain strands in the cognitive tradition in language research. Thus, the view of language to be developed in the present investigation can be typified by two key properties, both emanating from the cognitive-pragmatic perspective, viz. ‘depth’ and ‘dynamism’. Let me start, then, by characterizing these, and by situating them vis-à-vis some common conceptions and trends in the functionalist and cognitive traditions.

a. *Depth*

From a cognitive-pragmatic perspective, language is an integral subpart of its user’s mental world: it serves, hence operates in interaction and coordination with other, wider and deeper dimensions of human mental activity. Specifically, if language is a means to communicate, and if communication is (at least) a matter of transferring conceptual contents between minds, then it stands to reason that the cognitive systems and processes involved in language use are closely interrelated with the cognitive systems and processes concerned with conceptualization and thought. Hence language research must deal not only with the linguistic systems and processes per se, but also with how these relate to deeper dimensions of mental activity, and particularly to the conceptual systems and processes.

To avoid any misunderstandings: By ‘conceptual systems and processes’ I mean the cognitive infrastructure dealing with world knowledge, and its use.

World knowledge should be taken widely, involving knowledge about objects and events in the physical world, about structures and conventions in the social world, and about the individual's own and others' mental structures and operations, including intentions, attitudes, emotions, etc., all of these both veridical, based on perception and interpretation of reality, as well as fictive, based on creative imagination. Intentions, attitudes (including epistemic modal evaluations, which will be central in this investigation) and emotions as such obviously do not qualify as world knowledge (only one's interpretation of them does), but they necessarily have world knowledge as their object (one always wants, judges, loves, fears, something — Searle 1983), so they do belong under the umbrella of human conceptualization.[7] The conceptual systems also include mechanisms for archiving world knowledge, reasoning mechanisms which relate and combine chunks of knowledge to make logical inferences, deductions, etc., and different kinds of mechanisms which prepare conceptual knowledge for use in (linguistic or other) action, or which select and prepare information derived from perception for integration in the store of conceptual knowledge.

An active concern with cognitive dimensions beyond the linguistic, and particularly with conceptualization, is not common practice in most of traditional functional linguistics. It shows a distinct tendency (quite like formalist linguistics, for that matter, Generative Grammar being an extreme example) to limit attention exclusively to purely linguistic concepts and analytical categories, and to work in terms of 'encapsulated' grammar models which disregard anything surpassing the strictly linguistic dimension. This is in spite of functionalists' rejection of an autonomous concept of the language faculty. In Functional Grammar (Dik 1989a, 1997a, b), for example, the deepest component is the lexicon, which provides the ingredients for the basic representations, i.e. predicate-argument structures of the type in (1b) (dramatically simplified), which are subsequently subject to grammatical expression rules to form the surface string uttered as (1a).

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7. Many may find this disputable for the category of emotions, in view of the in western thinking deep rooted division between the domains of rationality and emotionality, and the tendency to associate notions such as 'conceptual' and 'cognitive' with the rational domain only. This division may be detrimental to our understanding of these phenomena, however. In fact, the borderline between the domains of emotions and of intentions and attitudes is far from sharp (cf., e.g., deontic or volitional attitudes).

(1) a. John hides pink elephants in his backyard
b. hide $(\text{John})_{Ag}$ $(\text{pink elephants})_{Go}$ $(\text{his backyard})_{Loc}$

However, the model does not spell out how it might relate to (a model of) conceptualization (despite some hints in Dik 1987a, 1988).[8] Similar remarks apply to other functionalist models, such as Role and Reference Grammar (Van Valin 1993) or Systemic Functional Grammar (Halliday 1994), or to the bulk of functionalist analyses of linguistic phenomena which are less bound to one or another theoretical model. Apparently, the functionalist tenet to look beyond language per se to what it does for mankind is only applied in methodology, viz. as a directive to observe what linguistic structures do in the world and use this to model these structures as such. But, no doubt due to the lack of a cognitive perspective, it is not applied in the theory, i.e. models do not attempt to render how these structures function in the wider context of how humans cognitively deal with the world.

But active attention for dimensions beyond the linguistic is often lacking in explicitly cognitive research as well. Surely, there have always been language psychologists — especially scholars of discourse processing and of non-literal meaning — who have explicitly recognized the importance of conceptualization for understanding linguistic performance (e.g., van Dijk and Kintsch 1983; Johnson-Laird 1983; see also several surveys in Gernsbacher ed. 1994). And Cognitive Linguists are probably even going furthest among all cognitive scientists in assuming that one cannot model the cognitive systems for linguistic behavior without fully integrating human conceptualization. But, ever since its upsurge in the sixties, most classical psycholinguistic research into what a cognitively plausible sentence grammar or processor might look like has avoided active involvement with matters such as conceptual representation. This was no doubt originally inspired by formalist linguists' notion of an autonomous linguistic competence, but has by and large survived even when more and more language psychologists

8. Dik has speculated that a representation of type (1b) might also be adequate to model conceptualization (see below). He did not have the time to systematically introduce this in Functional Grammar, however, Dik (1990) being a rare (if not the only) attempt to draw consequences for linguistic analysis. Otherwise, his suggestions have had little or no effect on research in this framework.

have abandoned (any radical version of) this notion.[9]

Yet many of the ongoing controversies in the area of sentence processing precisely go to illustrate the need to take conceptualization into account in modeling language. Among those controversies are very fundamental questions such as: How much syntax is required in processing (a problem particularly prominent in studies of language interpretation: does the parser perform a full syntactic analysis before anything else, or does it jump to semantic processing as soon as possible)? To what extent is language processing performed level-by-level and step-by-step (e.g., to what extent is language understanding bottom-up or top-down; to what extent does language production require full advance utterance planning or can it work incrementally, i.e. produce elements of the utterance as soon as they are available even if planning of the remainder of the utterance has not been completed yet)? To what extent is linguistic processing at different levels automatic vs. controlled, to what extent is it dedicated vs. interactive and flexible? Clearly, all these issues crucially hinge on the question how language processing relates to the conceptual system, and none of them can be resolved — and the cognitive plausibility of language processing models cannot be established — without taking the latter systematically into account.

The critical point is that neglect of dimensions beyond the linguistic leads to a tendency to deal with everything observable in terms of linguistic structures or processes. The result is models which have an 'overcapacity', accounting for phenomena, hence featuring structures and mechanisms, which do not belong there. One simple but prototypical case is the specification of selection restrictions on the argument positions of predicates in the lexicon. The grammar does not need to 'know' that one must be animate in order to breath, or that what one drinks is normally liquid. Such issues are solely a matter of one's knowledge of the world, to be dealt with in the conceptual system. No need to duplicate this information in the grammar, as the grammar will be informed by the conceptual system about which elements of the conceptual state of affairs are to be lexicalized for communication (Nuyts 1992b). The present investigation will feature a few other instances

9. The narrow focus even in current research clearly appears from the state of the art overviews on sentence parsing in Mitchell (1994), or on word recognition and lexical access in Balota (1994), Lively et al. (1994) and Simpson (1994), or on language production in Levelt (1989) and Bock and Levelt (1994).

of (at least partial) overcapacity in language models, involving accounts of scope relationships between semantic operators such as aspect, tense, and modality ('layered clause structure' in Functional Grammar and Role and Reference Grammar), as well as the treatment of the information structure of utterances (see Chapter 6).

Taking conceptualization into account in language research is not a simple matter, however. There is little or no consensus on the question what the human conceptual system looks like, and our understanding even of the basics of the issue is extremely poor (see Pederson and Nuyts 1997). A good illustration of this, specifically from the perspective of language, is the age-old debate about the priority of language or thought and the (in)dependency of the latter upon/from the former (see Dascal 1996). This issue has roots reaching back into antiquity, and has culminated in the controversies around the 'Sapir/Whorf hypothesis' regarding the universality or variability of conceptualization in view of language variation. The debate continues even today, but it is as far from a solution as ever. Of course, the dispute has predominantly remained at a philosophical (or even ideological) level, and has rarely given rise to concrete empirical research. But part of the problem is that parties do not even agree on what counts as valid evidence in the debate in the first place (cf., e.g., Lucy 1992; Pinker 1994; Gumperz and Levinson eds. 1996).

The last decades have witnessed quite a few attempts at more specific theories of conceptual representation, especially in AI and cognitive psychology (often independently from the question of the relationship to linguistic structure and processing, though), but to some extent also in linguistics. But minds diverge already on the basic issue of the nature of conceptual representation.[10] Most popular are propositionalist models (usually developed by scholars with a background in language research), but views within it are extremely varied, including (more or less) strongly language-based approaches (such as Fodor's 1975, 1987 'language of thought', Jackendoff's 1983, 1990 conceptual semantics, or Dik's 1987a, 1989b lexical view of conceptualization), different types of logics as proposed in formal semantics (e.g., Discourse

10. In AI models the 'knowledge database' is often even further developed than the language processor, but the problem with much of AI is that it aims to develop user-friendly systems for different practical purposes (translation, data-storage, interfaces, etc.), rather than a cognitively plausible model of human language processing or conceptualization.

Representation Theory — Kamp and Reyle 1993), and semantic network models (e.g., Schank et al.'s 1975 Conceptual Dependency Theory).[11] But there is also a growing tradition of research (not surprisingly with strong roots in research on visual perception) proposing image-based conceptualization (e.g., Paivio 1972, 1991; Kosslyn 1980, 1994; Marr 1982). Some propositionalists and imagists (e.g., Jackendoff, Dik, Paivio, Kosslyn) explicitly grant a role for the other type of representation in human conceptualization as well. Quite in general, the assumption that conceptualization is multimodal seems to predominate at the moment (see also Fletcher 1994; Kintsch 1994; Keller and Keller 1996; McNeill 1997). Yet there is no consensus (and scholars often do not clarify their view) on how the representational modes relate. For example, is the propositional or the imagistic mode predominant, or are they equal, are they separated or integrated, and if the latter, how, etc. And there are also those who explicitly deny the role of some representation types: e.g., several propositionalists, in the forefront Pylyshyn (1973, 1984), have heavily contested the role of imagery (cf. the 'imagery debate' — see Block ed. 1981).[12] Finally, there are models trying to surpass the proposition-image opposition by postulating a more abstract type of representation (e.g., mental models theory, Johnson-Laird 1983, Glenberg et al. 1994; mental models being analogical spatial arrays, they are closer to imagistic than to propositionalist models, though; moreover, this theory also admits a role for propositional representation, even if Johnson-Laird 1983: 205ff criticizes most current propositionalist theories).

Many Cognitive Linguists, too, are caught by the riddle of the nature of conceptualization (see Nuyts 1993d). Thus, Lakoff (1987) insists that thought is imaginative in nature, and he strongly argues against an 'objectivist' view of human categorization, of which he considers propositional models a primary feature. This might suggest a non-propositional, imagistic or more abstract view of conceptual knowledge. Yet in practice he appears

11. Whorfians are obviously likely to adopt propositionalism: cf. Whorf's (1956: 252) own view that "thinking itself is in a language — in English, in Sanskrit, in Chinese". Yet most of the developers of propositionalist models implicitly or even explicitly (e.g., Jackendoff) adopt a non-relativist, universalist view of conceptualization. Dik is one of the rare exceptions.

12. Significant for the state of the art in conceptualization research is that in this imagery debate, too, much of the controversy has been over the question what counts as valid evidence for or against imagery as a representational format in conceptualization.

to allow for conceptual models of all conceivable types (e.g., Lakoff 1987: 285ff): imagistic ones and propositional ones of different types. Similarly, Langacker (1987) stresses the role of imagery in conceptualization, and uses picture-like schemes to represent meaning, thus suggesting an imagistic view of conceptualization. Yet he also maintains that predicates — a clearly propositionalist notion — are the basic building blocks of semantic structure (which he equates with conceptual structure). And he occasionally states that his pictorial diagrams are no more than "informal" renderings of meaning, and that his view "does not imply any necessary commitment to sensory imagery as an exclusive or essential facet of the meaning of linguistic expressions" (Langacker 1987: 111). This is somewhat surprising since in practice Langacker's semantics is crucially determined by his schematic representations, and thus by a pictorialist or imagistic perspective. Talmy (e.g., 1996), on the other hand, appears to maintain a complex multimodal view of conceptual representation.[13]

This lack of agreement about the nature of conceptualization should not come as a surprise: attempts to understand the matter are severely obstructed by its extreme complexity and relative inaccessibility. Consider the position of conceptualization in the realm of human mental functioning. Obviously, humans interact with their environment not only through language but in quite many ways: they acquire information through different sense organs (visual, acoustic, tactile, olfactory, etc.) and act on the basis of this information through motor activity of a wide variety of types. Symbolic behavior, including language use, is actually a superimposed type of behavior, since it taps the basic possibilities of one or more sense organs and motor systems and conventionalizes certain patterns based on them as codes to convey specific (types of) meanings. Now, conceptualization is obviously not another among those systems for interaction with the world. Instead, it is a necessary ingredient for each of these behavioral systems (I will often use the term 'behavior' to cover both perception and action), since somehow they must all draw on a central representation of the way a human makes

13. Some — e.g., radical connectionists — believe that none of this is really an issue, because all there is is hardwired neural nets. I will not be concerned with this line of reasoning here, as I do not think a radically materialist view of cognition is maintainable or fruitful (see Nuyts 1992b: 7ff). This is irrespective of the question whether connectionist nets are plausible as a model of the neural systems related to the cognitive domains of language and thought.

sense of the world. One may reasonably assume, then, that the (core of the) conceptual system is shared by all behavioral systems, it coordinating and integrating all knowledge acquisition, and feeding and coordinating all types of knowledge-driven actions (Nuyts 1990c, 1992b). Without this assumption it is hard to see how human behavior as a whole could be (more or less) coherent, and how a human being could be perceived as a (mentally) integrated unified entity.

Now, all cognitive research faces a black box problem, but for the domain of conceptualization this problem is clearly double: even if conceptualization is present in all types of human behavior, it never surfaces directly, but is always covered by the different behaviors. That is, the format of conceptualization is not straightforwardly revealed in the perceptions or actions of the organism, as it is always and unavoidably filtered through the specific properties of the different perception and action systems. Surely, semiotic behavior such as language is relatively privileged in this respect: since it is specifically meant to code and transmit conceptual information, one may expect it to reveal much more about the nature of conceptualization than, say, chopping wood or driving a car. But even then, the conceptual structures are always unavoidably channeled through the structural properties of the behavioral system in which they are encoded (the gestural, the linguistic, etc.). Intuitions or introspective self-observation do not solve the problem (no matter how important controlled introspection is for understanding human cognition — Chafe 1994). They do allow (at least partial) access to the contents of one's conceptual knowledge (one can be aware of and reflect on one's knowledge of the world, though certainly not in an unlimited way), but they do not provide a means of knowing the nature of or the format in which this knowledge is represented, or the principles according to which it is stored, organized, and used. (See Nuyts 1992b, 1996a.) So, the only empirical way into conceptualization is to analyze behavioral patterns and search for elements in them beyond the properties of the cognitive systems dedicated to the behavior per se, which may thus pertain to and reveal features of the conceptual systems underlying the behavior. How to do this in practice is far from obvious, however, and is probably different for each single behavioral system. (Discussion of this problem of methodologies for investigating human conceptualization has been remarkably absent in cognitive science so far.)

Research on language (or any other perceptual or actional system for that matter), then, must refer to conceptualization not only to warrant adequate modeling of the linguistic systems and processes as such, but also for the sake of understanding conceptualization. But it is not alone responsible for the latter, of course: the task is ultimately multimodal. Since the conceptual system relates to many different behavioral systems, a full understanding of it requires an understanding of what each perceptual system contributes to the conceptual system, and how the conceptual system is involved in each behavioral system. Thus, theories of conceptualization resulting from an exclusively linguistic perspective run a high risk of being biased. This is not altered by the privileged position of language as a device dedicated to coding conceptualization for communication. The latter is methodologically relevant — language should be a good means to investigate conceptualization — but has no a priori theoretical implications — conceptualization as such is not necessarily coded in language. Surely, by virtue of the communicative function of language, a no doubt considerable part of humans' acquisition of information is achieved through language. Hence language is likely to be an important player in constituting conceptualization, and may have quite some influence on the latter's characteristics. Yet language is certainly not the only, and probably not even the most important player in this matter. Vision, for example, is at least as important as a source of conceptual knowledge. And it is one, moreover, which in the course of human development is operational long before the linguistic system (ontogenetically, and no doubt also phylogenetically). This corresponds to the fact that vision is one of the biologically basic or primary means of perception, while language is a superimposed (cultural) system (see above). Hence conceptualization is very likely to be at least as strongly determined by the properties of the visual system.[14]

Of course, among all behavioral systems language is no doubt the most intensively investigated. So it is no surprise that most current views on conceptualization have been inspired primarily by language, and that propositional models of conceptualization predominate and tend to be more

14. Hence, ideally, investigation of conceptualization should be multimodal. Unfortunately, such research is still very scarce. Promising in this respect is the recent upsurge of studies on gesture and how it combines with language (e.g., McNeill 1992, 1997; Kita 1993).

elaborate than other types of models (there is, e.g., no imagistic or abstract model as elaborate as Jackendoff's propositional model). But that is no more than a practical result of the circumstances. The plausibility of a model of conceptualization can only be assessed if it fully accommodates the requirements of all other behavioral systems, not just the linguistic. In fact, as the present investigation will reveal, even an analysis of language provides obvious indications that at least a strongly language-based propositional view of conceptualization — e.g., of the type proposed by Dik (cf. (1b) above) or Jackendoff — will not do (see Section 6.4).

In sum, language research is bound to be concerned with the linguistic and conceptual dimensions at the same time. We should always be aware of the fact that, though part of what we discover must be linguistic, another part of it must be conceptual. The critical question is, of course, how we can distinguish between the two. This issue, too, will receive explicit attention in the course of the present investigation. In any case, it requires the use of a comprehensive referential framework — much more comprehensive than most current (functional) grammar models — which allows one to 'think' in terms of the different dimensions involved. Doing so requires quite some speculation regarding dimensions which are currently poorly understood, and causes considerable abstractness in one's model as seen from the surface of actual linguistic expressions. But these consequences are unavoidable. Functionalist linguists often show a strong (and in certain respects justified) allergy against abstractness in linguistic analyses, because of the principle that one should stay close to the linguistic facts (e.g., Dik 1978, 1989a, 1997a). But the paradox with this position is that a consistent and 'cognitively informed' concern with the (complex) functionality of language use demands considerable degrees of analytical abstractness (as the analysis of epistemic modality below will amply illustrate). Of course, abstractness is strictly constrained by the requirement that it must be plausible from a functional perspective.

The necessary counterpart for speculativity and abstractness is, obviously, modesty and relativization: the awareness that we are dealing with matters at the edge of our current knowledge (and the solid part is small), which are partly beyond our own — the language researcher's — grasp. All we can do is offer tiny bits and pieces which may ultimately somehow fit into the large jigsaw-puzzle of the human mind (though fitting them may mean reshaping them). And putting the puzzle together is not something we

can do on our own, but requires the cooperation and consent of the entire community of scholars of (the many different faculties of) the human mind.

b. *Dynamism*

Another obvious corollary of the cognitive-pragmatic view — one intimately intertwined with the issue of depth — is that language is a dynamic entity. Since language serves as a mediator in the activity of communicating conceptual contents, it stands to reason that the linguistic system must be conceived as a usage system. And it must moreover be a highly context-sensitive, hence flexible and adaptive one: its operations are bound to adjust continually to complex and ever-changing circumstances, as communicating implies actively dealing with several dimensions in the communicative situation (Nuyts 1993b), and as no two communicative situations are identical (and most situations are in fact wildly divergent). Showing how this works and what this involves is another central issue for language research.

Functionalist linguistics does, again, not live up to all the implications of this observation. Surely, functionalists have been pioneers in abolishing the view fashionable in traditional linguistics of language as a static, unchanging pattern, and the corresponding sharp division between synchrony and diachrony and between adult and child language. At a general level, modern functionalism stresses that linguistic structure is constantly changing and evolving due to the multiplicity of (often counteracting) functional factors to which it is exposed, languages showing many signs of this dynamics of change at any moment of their 'life'. The recent upsurge of grammaticalization research perfectly illustrates this changing attitude. This is obviously an essential component of a dynamic view of language, and one which will be important in the present investigation as well.

But much of mainstream functionalist linguistics is not drawing the consequences of the dynamic view (yet) when it comes to the design of grammar models and the analysis of linguistic phenomena in terms of them (no doubt again due to lack of a cognitive perspective). It does reject the formalist view of linguistic knowledge as an encapsulated competence system with no direct links to linguistic performance (cf. Nuyts 1992b: 91ff), but nevertheless it still presents a predominantly static view of the linguistic system. Grammatical structure is still depicted as a fixed, stable, coherent and integrative unit (a 'gestalt', so to speak), which accords to quite rigid compositional principles. And most models are primarily concerned with the

representation of this grammatical structure at different levels of description, sometimes with the addition of strict and fixed systems of formal rules which ‘unintelligently’ produce, modify, or relate these fixed representations.

However, the dynamic nature of language use suggests — and naturalistic observation confirms — that linguistic structure is quite variable and flexible, and often even diffuse and incoherent, with different degrees of internal cohesion (i.e., components may be more or less integrated), depending on differences in its functional organization (cf. Hopper 1987). As anyone with practice in analyzing natural conversation knows, spoken utterances are often very loose and far from clearly demarcated (cf. Chafe 1994). The present investigation, too, will offer a nice illustration of the (functionally determined) flexible nature of linguistic structure in the range of epistemic expression forms. The dynamic nature of language equally implies that (our models of) the cognitive systems for language use must be essentially procedural in nature, with — in view of the complexity of communication probably quite sophisticated, intelligent and flexible — processing instructions being at least as central as representations. In Langacker’s (1987: 57) words: a grammar is “a constantly evolving set of cognitive routines that are shaped, maintained, and modified by language use. A speaker’s ‘knowledge’ of his/her language is therefore procedural rather than declarative” (cf. also Langacker 1997: 237).

In view of the latter statement, it appears paradoxical that precisely the Cognitive Linguistics movement is even more radical than traditional functionalist linguistics in presenting a static or passive view of grammar. Models such as Cognitive Grammar (Langacker 1987) or Construction Grammar (à la Lakoff 1987 or à la Fillmore 1988, Fillmore et al. 1988) heavily rely on fixed constructions to account for linguistic structure, up to the level of the sentence. This translates into a concept of grammar as a network of such constructions, in which there is hardly any concern with, or even room for, the processing dimension. Surely, one must agree that fixed grammatical patterns deserve a much more prominent role than they receive in most traditional grammars. They are not only needed for idioms but probably also for frequently occurring basic structures, even of considerable complexity, such as the major sentence types or special constructions such as clefts, causatives, presentatives, etc. But this is not an argument for an entirely processless concept of a grammar: fixed constructions are not only perfectly compatible with a procedural perspective, they even cannot function

in language use if there are no procedures to apply them in producing or analyzing utterances. Any viable model of linguistic (or other) behavior must be concerned with representations as well as procedures for handling them, in a balanced and integrated fashion (cf. Barsalou and Hale 1993).

Langacker explicitly rejects a process view of grammar, however. In part, this appears inspired by a rejection of a generative concept of grammar of the type involved in Generative Grammar and similar models (Langacker 1987: 63–65). But, as argued in Nuyts (1993d: 283ff), a process view need not (and from a cognitive-pragmatic perspective even should not — see Nuyts 1992b: 124ff) involve a concept of generativity at all. Langacker (1987: 65) also argues that "[p]utting together novel expressions is something that speakers do, not grammars". Of course, one can only agree that grammar is not an isolated entity solely responsible for language use. Nevertheless, it is the grammar which contains what humans need so as to be able to use language. Even creative language use depends on it. Thus, if a newly acquired noun has to be pluralized, it is the grammar which provides the instruction that this is usually done by adding an -*s* to the noun. Even if it is the speaker who decides on doing it, and can decide not to do it or to do it differently. So the cognitive grammar is responsible even for the construction of novel expressions, albeit in interaction with other parts of the cognitive systems, including the store of world knowledge.

Langacker's (and presumably other Cognitive Linguists') rejection of a process view of grammar turns out to have a deeper meaning, however.

> The issue of explicit representation is a central point of contention between proponents of connectionist vs. symbolic modes of processing. [… Cognitive Grammar] posits nothing comparable to a basic component of classic symbolic processing, namely the step-by-step execution of a program by a central processing unit. Moreover, it does not assume that linguistic structures and patterns are stored as such — there is no supposition that by looking at the right part of the brain either a neuroscientist or a homunculus could actually see them. They are rather to be found in processing activity and are thus emergent rather than fundamental. […] Linguistic rules and structures are thus procedural in nature — they reside in what a speaker does, not in a list of instructions to be consulted and followed, nor in 'representations' (s)he is able to examine. [… The term mental representations …] merely indicates the occurrence of neurological adjustments, notably changes in the strength of synaptic connections, that influence subsequent processing and facilitate the emergence of patterns of activity

> constitutive of particular kinds of mental experience. […] As linguists, we have neither the ability nor any particular reason to concern ourselves with the specific synaptic adjustments that are ultimately responsible for language processing. The object of investigation must instead be entities that emerge in processing and represent higher (perhaps considerably higher) levels of cognitive organization. We can examine such entities either from the standpoint of the processing activity per se, or else phenomenologically, i.e., in terms of the experience it constitutes (as well as its behavioral correlates and consequences). The former — comprising the study of neural connections, patterns of activation, etc. — is the province of neuroscientists. Linguistic and psychological research deals primarily with the latter. (Langacker 1997: 239–240 — emphases omitted)

The bottom line appears to be that, even if what goes on in language users is processing activity, a grammar need not (or even should not) be a processing model, since the grammar does not literally model what language users do. Although the model is nevertheless a 'cognitive' one.

This has something of a mystification of grammar, however. In scientific discourse about language users' capacities, Cognitive Grammarians fully acknowledge that language is a dynamic, constantly changing, procedural object. This is clearly an observation about what Langacker calls 'phenomenology'. Thus his opposition of 'processing activity' — the realm of neuroscientists — and 'phenomenology' — the realm of cognitive scientists — is hard to come by (unless 'procedural' and 'processing' are to mean something different): while neurological processing activity is in the province of neuroscientists, cognitive processing activity is squarely within the province of cognitive scientists. So even if one accepts the basic philosophy behind Langacker's notions of the phenomenological and the biological,[15] if the phenomenological object is dynamic, procedural, the phenomenological model accounting for the object should be dynamic, procedural, as well.[16,17] In this respect, then, the processual concept of the

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15. I, for one, do believe that cognitive systems as described in our theoretical models (if they are adequate) are somehow coded in the neurological system. I would not use the term 'stored', either, however. And like Langacker, I do not believe that we can 'see' them by looking at the brain (see Nuyts 1992b: 6ff). But this dispute is immaterial for the question whether one should accept a procedural concept of grammar, pace Langacker's suggestion.

16. Despite the differences in the theories, Langacker's argument is akin to the mystification found in Chomsky's discourse about what a Generative Grammar is or does. Chomsky claims

cognitive organization of language commonly found in language psychology seems more appropriate than the Cognitive Linguistic concept.

Mainstream language psychology often does not take all aspects of the dynamic nature of language use seriously either, however. Especially sentence production and parsing are predominantly conceived of as highly automatic, dedicated, informationally encapsulated, hence inflexible processes. Yet, given the complex set of functional factors determining language use in communication (see Nuyts 1993b), utterance processing must be able to take systematic recourse to several different sources of conceptual information so as to produce or understand utterances in accordance with the circumstances (this includes knowledge not only of facts in the world the utterance is about, but also of the hearer's knowledge, status, background, etc., of general social norms and rules, of the actual communicative setting, etc.). Thus, automatic processing is no doubt central at superficial, phonological, morphological and elementary syntactic levels (although even there automaticity cannot be complete: cf., e.g., the often conscious choice between alternative pronunciations depending on the features of the communicative context). But already in the realm of syntactic structure there must be considerable room for intelligent and interactive processing (see Nuyts 1992b: 244–256). Likewise, processing must be flexibly adaptable and adjustable, able to follow different paths depending on the language user's ongoing decision-making in the actual (each time different and ever changing) situation (even if the execution of detailed processes along the chosen route may be automatic). This no doubt extends beyond the types of flexibility usually acknowledged in language psychology, such as the principle of incremental processing, whereby an utterance is produced bit by bit in the order in which (and as soon as) conceptual elements become available to the production system (see Kempen and Hoenkamp 1988; Levelt 1989). (But see, e.g., Sanford and Garrod 1994 for psychological research in this vein.)

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that his model does not produce anything but relates meanings and phonetic patterns in a neutral way. Yet Generative Grammar (in whatever version) formally **is** a productive system which does not neutrally relate meanings and forms at all (see Nuyts 1992b: 125–126). Langacker's argument has in common with this that there is a disconnection between what the model is claimed to stand for, and what the formalism of the model actually renders.

17. All of this is completely irrespective of the question whether connectionist type models are adequate to understand the neurological part of the business.

The foregoing also implies a clear stance in the modularity debate, which keeps on plaguing cognitive research, linguistic and other (e.g., Fodor 1983). Since specific mental activities (such as conceptualization, language processing, vision, etc.) have unique characteristics, the cognitive systems performing them obviously do have a certain degree of autonomy. But at the same time those cognitive systems intimately cooperate in many ways, hence critically depend on each other. As argued, this is clearly true for the linguistic and the conceptual systems. Probably, there is not even a sharp dividing line between the operations of the two: language production no doubt works its way from conceptual to surface linguistic representation gradually, with intermediary stages which are decreasingly conceptual and increasingly linguistic yet involve operations relating to conceptual as well as to linguistic elements (a similar picture holds for language understanding). But close interconnections are equally critical for different behavioral systems mutually: understanding an opera performance, e.g., requires coordinated and integrated visual, acoustic and linguistic perception; and everyday communication requires permanent coordinated interaction — in production as well as in perception — between auditory-based language use and vision-based non-verbal behavior such as gesture (cf. McNeill 1992, 1997). These facts suggest that the human mind is to some extent componential, yet with fuzzy boundaries between the components. The major point is, however, that this matter cannot be settled in an aprioristic way. When and to what extent procedures and structures can be grouped in components is to be determined by empirical research, and will become obvious only **after** we have gotten to understand how different types of behavior come about. In our present state of knowledge, any strong claims about modularity are entirely ideological. And from a methodological perspective they are even damaging, as they invite narrow focus on the properties of isolated behavioral systems, and prohibit concern with the way systems interact and interrelate.

‘Depth’ and ‘dynamism’, then, will strongly determine the spirit of the present empirical analysis, and a major point of the theoretical discussion will be to show what they stand for in modeling the cognitive infrastructure for language use. Hopefully, it will become obvious that taking these dimensions seriously in language research is not a matter of exotic luxury, of no concern to classical (functionalist) linguists (but only to cognitive psychologists or other such foreign folks). Dealing with them is essential in

order to get a better grasp of the empirical facts of language as such, as illustrated here in the realm of epistemic modal expressions. And it is essential to making functionalist linguistics a viable partner in the interdisciplinary enterprise of cognitive science.

Finally, a word regarding the perspective on the directionality of language processing adopted here. Both the empirical analysis and the theoretical discussion will take the perspective of language production. This is not a theoretical option: it is due to the practical circumstance that this investigation is rooted in linguistics, and linguistics has traditionally been production-oriented in its approach to language (for historical reasons). A plus to this orientation is that it fills a practical need: although there is a serious body of work on language production in language psychology (see Levelt 1989), language understanding has received much more attention. And since (as Levelt's survey shows) language production research has predominantly focused on phonetic, phonological, lexical and superficial syntactic aspects, the deeper syntactic, semantic and conceptual dimensions of this mode of processing, which will be of central concern here, are in need of a special effort. Of course, on the reasonable assumption that ultimately language production and interpretation operate in terms of the same basic notions and structure types (see Nuyts 1992b: 244ff), the basic categories emerging from the analyses will hopefully be valid for our understanding of language (processing) in general.

1.3 Epistemic modality: A paradigmatic approach

Let us turn to the empirical topic of this investigation, viz. the semantic domain of epistemic modality. Epistemic modality is defined here as (the linguistic expression of) an evaluation of the chances that a certain hypothetical state of affairs under consideration (or some aspect of it) will occur, is occurring, or has occurred in a possible world which serves as the universe of interpretation for the evaluation process, and which, in the default case, is the real world (or rather, the evaluator's interpretation of it — see Nuyts 1992b: 47ff, 1993b). The evaluator is prototypically the speaker him/herself, but this need not be so: a speaker can also report on someone else's evaluation (see Section 1.4b below). In other words, epistemic modality concerns an estimation of the likelihood that (some aspect of) a certain state of affairs

is/has been/will be true (or false) in the context of the possible world under consideration.[18] And this estimation of likelihood is situated on a scale (henceforth called the 'epistemic scale') going from certainty that the state of affairs applies, via a neutral or agnostic stance towards its occurrence, to certainty that it does not apply, with intermediary positions on the positive and the negative sides of the scale.[19]

Although it has been (and continues to be) subject to considerable research effort, epistemic modality is one of those phenomena which keeps on puzzling linguists. Few will want to dispute the basic identity of the subject matter as involving estimations of the likelihood of states of affairs.[20] But quarrels already start over the precise extension of the definition (what are linguistic instances of epistemic modality and what not), over whether the category should be further subdivided in types (and if so, how), and over how it should be demarcated from a number of other, related semantic categories. An equally pervasive problem — and no doubt an important factor in the disputes over definition and demarcation — resides in the question how to understand the quite strange and often apparently very non-systematic properties of epistemic modal expressions in many domains of

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18. The notion of 'truth' as used in this definition should not be interpreted as a theoretical notion (as it occurs in truth-conditional semantics). Rather, it refers to a general pre-theoretical concept people have and somehow use in thinking about the world, which is thus a subject of investigation. Whenever I use the notion, it is in this sense.

19. Especially in formal semantic approaches, one sometimes discerns a tendency to deal with epistemic modality (and modality in general), not in terms of a scale, but in terms of discrete categories, usually (only) possibility and necessity. From a cognitive and functional perspective, however, there are strong arguments to assume that humans do think in terms of a scale, even if for most purposes they will probably only distinguish rough positions on it. Thus, English, Dutch or German have basic terminology only for, most precisely, certainty, probability, possibility, improbability, and impossibility. But speakers can further scalarize these positions by means of grading expressions (*very probable*, *rather certain*, *not entirely impossible*, etc.). And ultimately, if really needed, they can even quantify likelihood (e.g., *a 90 percent chance*). It is hard to see how a 'discrete categories' approach can handle these facts.

20. Some have related the epistemic scale to concepts such as 'force dynamics' (Talmy 1988a; Sweetser 1990) or 'degrees of distance' (Fleischman 1989). No question that the cognitive concept of degrees of likelihood may be related to such other conceptual categories, e.g., in that expressions of temporal distance get metaphorically used to express degrees of likelihood, as Fleischman shows. But any suggestion that the former might be reducible to the latter is unwarranted. Veridicality of information is — intuitively and observationally — too basic a category in a human's interaction with the world (see below) to be explained away.

grammar, from the morphological and syntactic to the semantic and discourse-interactional (properties which will be presented in detail later). In other words, beyond a general, intuitively straightforward definition, (the behavior of) epistemic modality has so far proven very elusive and volatile, and empirically hard to assess (see Section 1.5).

Now, from the above definition alone it is plausible to assume — and the analyses in this monograph will provide ample further evidence — that epistemic modality is not a specifically linguistic category. Estimations of the degree to which states of affairs are true of the world are no doubt an essential ingredient of any kind of human perception and action, as the veridicality of a human's understanding of the world is critical for his/her adequate functioning in it (and, ultimately, for his/her survival). So, epistemic evaluations are probably a basic category of human conceptualization in general, emerging from high-level metarepresentational operations over knowledge, in which the performer compares his/her assumptions about a state of affairs to whatever other information about the world (s)he has available and considers relevant to the state of affairs. Epistemic expressions in language, then, are likely to originate in such high-level conceptual operations as well. Hence, an investigation of them can probably not be limited to a purely linguistic description (the many attempts in the literature to do so notwithstanding), but will also require a concern with the conceptual systems from which they derive.

If seen in the light of the discussion in Section 1.2, then, the problem of the complexity and volatility of epistemic modality in language turns into a virtue. For it may be an excellent case to show how a systematic and comprehensive functional analysis of the linguistic expressions of this semantic category, which fully acknowledges the dimensions of depth and dynamism, can improve our understanding of the behavior of those expressions. At the same time, it holds the potential of being a rich source of information on the question how linguistic processing relates to deeper dimensions of conceptual structure and processing. And it may even provide ways to find out more about the status and functioning in human conceptualization of epistemic evaluations, and, by extrapolation, even of metarepresentational dimensions in general. In fact, it will turn out to offer a strong case for a sophisticated layered concept of the conceptual system (cf. Chapter 6).

How should we proceed to achieve these goals? So far, epistemic modality has rarely been investigated as a subject matter per se. It has

usually featured in the context of investigations of specific categories of linguistic forms, mainly the modal auxiliaries and (in grammaticalization research) grammatical expressions of modal meanings more in general. This corresponds to the classical linguistic way of investigating language, viz. to start out from a particular linguistic structure and try to account for its linguistic features. In a functionalist frame this then critically includes reference to the meanings and uses of the structure — i.e. a form-to-function approach. The consequence is that so far concern with epistemic modality has neither been specific nor comprehensive: it has not been specific because epistemic modality figures as one among many meanings in the analysis, and it has not been comprehensive because there is no concern with the (systematicity in the) wider range of linguistic manifestations of the semantic category. Most of this research has actually not excelled in taking a radical and systematic functional orientation, even if much of it counts as part of functionalist linguistics. Focus has largely been limited to the grammatical properties of linguistic forms (grammaticalization studies, e.g., have mainly concentrated on the patterns of structural development of forms) and/or to the 'logical' features of the semantic dimensions involved (matters of scope, ambiguity, generality, etc.). The usage properties of the forms, however, such as interactional and discourse-functional dimensions, have often been disregarded.

Our cognitive-pragmatic perspective suggests an alternative way to tackle the matter, viz. a function-to-form approach. This involves (i) to start out from a specific and clearly definable abstract functional category, here the semantic category of epistemic modality, and (ii) to investigate the range of manifestations of this category in linguistic structure, so as to get a systematic picture of how the link between function and form in this 'functional paradigm' works. Let's call this a 'paradigmatic approach'.

a. *A narrow specification of the functional domain*

Traditionally, epistemic modality is viewed as part of a wider group of 'qualifications' of states of affairs (as I will call semantic concepts of the 'tense-aspect-modality' type), all labeled 'modal', viz. those expressed by the modal auxiliaries. Thus, the term 'modality' usually covers three categories

of qualifications.[21] Besides epistemic modality, this involves deontic modality, as well as (depending on the terminology) dynamic (Palmer 1979, 1983; Perkins 1983), facultative (De Schutter 1983; Goossens 1985) or inherent (Hengeveld 1988) modality (I will use the term ‘dynamic modality’). Deontic modality is an evaluation of the moral acceptability, desirability or necessity of a state of affairs, i.e. it crucially involves notions such as ‘allowance’, ‘permission’ and ‘obligation’. Dynamic modality involves an ascription of a capacity or a need to the subject-participant in the state of affairs, or of a situation-internal potential or necessity for him/her/it to do something (usually this involves animate entities, but it can also be extended to inanimate subjects).

In the Anglo-American literature one also frequently encounters the term ‘root modality’. This term is sometimes explicitly related to deontic modality, among others by Steele (1975a), Talmy (1988a) and Sweetser (1990). But Sweetser’s and probably also Talmy’s actual use of it turns out to be wider, also including (at least part of) dynamic modality. And Hofmann (1976) and Coates (1983), for example, explicitly use root modality as a cover term for deontic and dynamic modality. In this latter usage root modality is synonymous with yet another term currently gaining popularity, viz. ‘agent-oriented’ modality, which is opposed to ‘speaker-oriented’ and epistemic modality (terminology introduced by Bybee 1985, Bybee et al. 1994, Bybee and Fleischman eds. 1995).

Including deontic and dynamic modality in one term is unfortunate, however, since this is an invitation to treat them on a par, while they are actually clearly different categories, as the definitions alone may show (and as will appear in the analyses below). This is true particularly also in the area of agent vs. speaker orientation. Dynamic modality is fully agent-oriented (at least if the notion of an agent is interpreted widely enough). But deontic modality is as much speaker-oriented as agent-oriented: the permission, obligation, etc. is usually directed at the agent in — or controller of — the state of affairs (very often the hearer); but the speaker is manifestly

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21. The term ‘modality’ is sometimes also used to cover any kind of speaker qualification of a state of affairs (i.e. including emotional attitude, evidentiality, or even tense and aspect). This use is most common in philosophy (see Perkins 1983: 6ff and Palmer 1986: 9ff for references), but occasionally also occurs in linguistics (e.g., Ransom 1977, 1986; Dietrich 1992). So used, the term is synonymous with the present notion of a qualification.

present as either the issuer of the permission etc., or as the carrier or messenger of a permission etc. issued by someone else. Therefore, I will not use the terms root modality or agent-oriented modality here. (The issue of agent vs. speaker orientation as such obviously does have to figure in the analyses.)

But in the same vein there is little reason to group dynamic, deontic, and epistemic modality into one semantic supercategory. Thus, still regarding agent- vs. speaker orientation, as will be obvious from the above definition, epistemic modality differs from dynamic and deontic modality in being completely speaker-oriented (at least in the prototypical case: there is agent-orientation in reporting on epistemic evaluations — cf. Section 1.4b).[22] Surely, there are common elements in the semantics of the three modalities. Talmy (1988a), for example, argues that there is an element of force-dynamics in each of them. But he shows that this element is equally present in several other linguistic categories, so it does not warrant a grouping of these three. Perkins (1983) characterizes the modalities as resulting from relating a state of affairs to specific domains of knowledge (about natural laws, about social rules and conventions, or about rational principles). But again, this characterization can also be used for (most) other qualifications, such as evidentiality (relating a state of affairs to types of informational source-domains), tense (relating a state of affairs to the time-axis), or spatiality (relating a state of affairs to physical space). (This characterization may not fit all of these equally well, but that is true for the three modalities as well. See Section 6.6.)

This is obviously not to say that it is a sheer accident that these three meanings are (often) expressed by the system of the modal auxiliaries. Such a claim would lack any credibility in view of the strong cross-linguistic validity of this trend (cf. Chapter 4). Diachronically, there must be a rationale for this in that (probably quite abstract) correspondences between these meanings must have motivated an extension of the use of the modals from one to another of them (see, e.g., Sweetser 1990 for an account). But this does not conflict with the observation that these semantic categories are otherwise no less different from each other than from other categories such

22. Hence, also Bybee's (1985) and Bybee et al.'s (1994: 177–180) distinction between epistemic and speaker-oriented modality (forms such as imperative, optative, permissive, etc.) is terminologically unfortunate, as epistemic modality is extremely speaker-oriented.

as evidentiality or time (many of which are also expressed in auxiliary forms, and even play a role in the system of the modal auxiliaries, as will be discussed in Chapter 4). It does mean, though, that none of these qualifications — the modalities or any other — can be studied without keeping an eye on (all) the others, since they relate and interact in intricate ways. Under this condition, then, it seems perfectly legitimate to concentrate on the notion of epistemic modality as a clearly identifiable, separate category, without making a priori assumptions about preferential links to deontic and dynamic modality.

In the same vein (and as suggested in the foregoing), the present notion of epistemic modality does not include evidentiality. Sometimes these categories are conflated. Bybee (1985) and Palmer (1986), for example, include evidentials in the category of epistemic modality, and Hengeveld's (1988, 1989) category of 'epistemological modality' covers subjective epistemic modality next to evidential categories such as quotative, inferential, experiential, hear-say, etc. Yet the notion of evidentiality can be defined such that it is clearly distinct from the category of epistemic modality. Evidentiality concerns the speaker's indication of the nature (the type and quality) of the evidence invoked for (assuming the existence of) the state of affairs expressed in the utterance. This does not involve any explicit evaluation in terms of the state of affairs being true or not.

It is beyond doubt — and the present investigation will clearly show — that there are close relations between the two qualifications so defined (much closer than between epistemic and deontic or dynamic modality, actually). Thus, evidential categories often suggest or imply a certain degree of probability of the state of affairs. For example, hear-say evidence tends to be considered less reliable than direct visual perception. Hence the former often suggests lower probability of the state of affairs than the latter, which normally implies certainty. The nature of the speaker's evidence will thus no doubt also codetermine the outcome of his/her epistemic modal evaluation of a state of affairs, if (s)he makes one. The close tie between epistemic modality and evidentiality also surfaces in the conditions under which evidential markings tend to occur, cross-linguistically. As Givón (1982) argues, evidentials tend to occur in conceptual domains characterized by medium epistemic certainty, they may but tend not to occur in domains of highest epistemic certainty, and they do not occur in the epistemic space of lowest certainty. But these observations do not change the fact that the two categories express different aspects of the status of conceptual knowledge,

and should thus not be lumped together on an a priori basis. Even if they do suggest that there will be very intricate interactions between the two, and that the borderline between them will not always be easy to draw (as will in fact turn out to be the case).

On the other hand, as may be obvious from the above definition, the present analysis will assume that epistemic modality does include (or is inseparably connected with) the dimension of polarity. For it seems quite impossible to characterize the epistemic scale without assuming a positive and a negative pole in it. The following chapters will offer support for this assumption. Still, since in the linguistic expression of an epistemic evaluation the polar component often surfaces separately from the scalar component (e.g. in combinations of an expression of probability and a negative particle), we will often have to talk about these two components as if they were separate things. How this superficial separation of dimensions of a conceptually integrated category may work will be spelled out in the course of this investigation.

Finally, this investigation does not distinguish a category of 'alethic' modality next to epistemic modality, as is often done in modal logic and formal semantics (see Lyons 1977: 791f; Palmer 1979: 2–3, 1986: 10–11). According to these traditions, alethic modality would concern the necessary or contingent truth of propositions (i.e. 'modes of truth'), while epistemic modality would concern the state of a proposition in terms of knowledge and belief (i.e. 'modes of knowing'). To the extent that this distinction relates to that between subjective and objective epistemic modality in linguistic semantics (on this link, see Lyons 1977), I can refer to the discussion of the latter in Section 1.4 and the following chapters. If it should distinguish types of probability in terms of something like 'truth in the world' vs. 'truth in an individual's mind', however, it has no role in an analysis of the cognitive status of epistemic modality. As Palmer (1986: 11) states, "there is no distinction between […] what is logically true and what the speaker believes, as a matter of fact, to be true". As far as the semantics of natural language goes, 'truth' is always truth for the language user, hence truth in his/her knowledge of the world (see Nuyts 1992b: 47ff). Thus, it is not surprising to find that "there is no formal grammatical distinction in English, and, perhaps, in no other language either, between alethic and epistemic modality" (Palmer 1986: 11). The present investigation will not uncover one either.

b. *A broad functional perspective on the linguistic manifestations of the semantic domain*

As mentioned, research covering epistemic modality has predominantly focused on one type of linguistic expression, viz. the modal auxiliaries. Sometimes one even discerns a tendency to simply equate the study of (epistemic) modality with an analysis of the modals. Yet epistemic modality can obviously be expressed by means of many different linguistic form types, grammatical as well as lexical ones. This is true across languages, and often even within one language. Thus, most or all West European languages have at least four major linguistic form types which (intuitively) can express epistemic modality, viz. modal adverbs as in (2), predicatively used modal adjectives as in (3), and mental state predicates as in (4), next to the modal auxiliaries as in (5). The notion of epistemic modality has occasionally featured in investigations of these other expression types as well, but again usually in function of the linguistic analysis of the expression type in isolation.

(2) Maybe/probably/certainly/… they have run out of fuel

(3) It is possible/probable/likely/certain/… that they have run out of fuel

(4) I think/believe/… they have run out of fuel

(5) They may/might/must/… have run out of fuel

The present investigation, then, will offer an integral analysis of the four expression types presented in (2)–(5) above, in Dutch, German, and English (see Section 1.5).

There are, of course, yet other form types allowing the expression of epistemic modality in (some of) the West European languages, including nouns, modal particles (e.g. in German and Dutch), and certain tenses (especially past tense forms) and moods (the subjunctive in German, French, and Spanish). These are not included among the central ones to be investigated here, because they are either not autonomous as epistemic expressions (e.g., tense, the subjunctive, and probably also the particles, at least in Dutch), and/or very infrequent (e.g., nouns), and/or not generally available in the languages to be considered (particles do not occur in English, and the subjunctive is not available anymore in Dutch and English). Most of them will receive attention in the context of the analyses of the central expression types, however (and see especially Chapter 5 on the role of other lexical expression types, and particularly the particles, in Dutch).

Of course, analyzing this functional paradigm is not a simple matter, in view of the complex nature of the form-function mapping in language. Even if all the expression types in (2)–(5) express epistemic modality, intuition tells that there are differences in how they are used. Not surprisingly: as Bolinger (1977) has argued already, there are no real synonyms. If there are alternative expressions for one semantic category, then there must be reasons for their existence, which cause them to be used in (sometimes slightly) different ways. Hence, a paradigmatic analysis of the expression types in (2)–(5) crucially involves finding out how these forms differ functionally. Or, in dynamic, procedural terms, the question is: What do speakers do when they use one of these alternatives? Given the urge to communicate an epistemic evaluation, which factors cause them to choose one of these expressions rather than another in actual communicative situations?

Why would a paradigmatic approach as characterised in (a)–(b) above hold a better promise to achieve our goals? First of all, it promises a better understanding of the semantics and syntax of the epistemic expression types in (2)–(5), as follows. On the one hand, it offers a test for our intuitive assumption that all of these do express epistemic modality. If this assumption is true, the usage differences between the alternatives should be explicable entirely in terms of functional dimensions other than the epistemic evaluation, and without affecting the core notion of epistemic modality. That is, we should not be forced to distinguish semantically different types of epistemic modality expressed in different linguistic forms (such as a distinction between subjective and objective modality, to be discussed below). At the same time, if epistemic modality is basic to all these expression types, we may expect the differentiating functional factors to be somehow logically related to and/or to some extent influenced by the epistemic dimension, albeit possibly with different results for the different expression types. On the other hand, this approach may throw new light on the puzzling behavior of these expression types. Comparing them in the context of a comprehensive functional analysis may help to identify and explain critical linguistic features typical for each, and for the set as a whole. Thus, we may expect to find linguistic correspondences between the alternatives which are due to the shared basic meaning of epistemic modality, but we can also expect to find (partial) linguistic differences between them due to differences in the other functional dimensions involved in their use.

Second, if we manage to relate the different expression types to one shared category of epistemic modality plus a series of differentiating functional factors, then we are in a theoretically interesting situation. For then we have a solid basis to draw inferences regarding the cognitive infrastructure and processing needed to get from the epistemic concept to the actual epistemic expressions. That is, we can then try to draw a cognitive 'map', in which the concept of epistemic modality will have to figure at the core, and in which the differentiating functional factors will have to figure along the route from that core to the surface of the alternative expression types. Our (multidimensional) insights into the relations between epistemic modality, the other functional factors and the formal properties of the expression types should allow us to distinguish between elements inherent in the linguistic systems producing the expressions proper, and elements which go beyond language as such and must therefore be considered part of the conceptual systems. From there to seeing the more general implications for the issue of (the dynamics of) the relation between language and conceptualization as sketched in Section 1.2 is a small step.[23]

Of course, even in this paradigmatic approach the practical analysis must start somewhere. Despite the fact that the modal auxiliaries are by far the most intensively investigated expression type, I will not take them as a starting point, for several reasons. First of all, the literature shows that the modals are semantically and structurally very hard to grasp: despite the huge number of analyses, we still have a poor understanding of them. An analysis of other epistemic expression types may help to improve our understanding of the modals. Secondly, and more importantly, while the modals are special in quite systematically allowing the expression of different types of qualifications, there is no a priori reason to believe that they are more interesting than other expression types from the perspective of our concern with epistemic modality per se. In fact, epistemic uses of the modals may be frequent in English (for *may* and *might* the epistemic use is even the primary one — see Coates 1983), but, probably against common expectation (see Chapter 4), they are much rarer and less articulated in the two other languages

23. This paradigmatic approach is obviously applicable to any other semantic or functional domain in language, with the same potential for investigating the research question formulated in Section 1.2. Unfortunately, it is quite rare in empirical research in linguistics in general.

in focus here, viz. Dutch and German. Moreover, in view of our discussion above, the polysemous nature of the modals is a disadvantage if we want to avoid an a priori bias regarding the relations between epistemic modality and other qualificational categories.

A more interesting starting point, then, is provided by the sentence adverbs and the predicative adjectives. For two reasons. First, these appear to be the most straightforward and precise means to render epistemic modality, at least in West Germanic: they unambiguously name the degree of epistemic likelihood, which is not the case (at least not in the same way) in the other expression types. Second, on the basis of the (frequent) lexical coincidence between the adverbs and adjectives (apart from the morphological difference in English, which is usually even absent in Dutch and German), the expressions in (2) and (3) seem very comparable at first sight (although there are some remarkable differences in their behavior, as will appear). That is, as compared to the other expression types they seem to be in a minimal-pair-like position. For these reasons a comparative analysis of them might be a good means to get a first understanding of what determines the expression of epistemic modality. Armed with these insights, we will then be able to throw a better light on the two other expression types.

1.4 Other functional factors in the analysis: A preview

For the sake of clarity of the presentation in the empirical chapters, let me give a prospective overview and characterization of the different functional factors besides the epistemic qualification which will turn out to codetermine the use of the different expression types in the languages considered here. The ordering of the factors below renders the order in which they will be handled in the empirical analyses, and this is motivated by ease and efficiency of presentation. (It actually partly reflects deeper logical relations between the factors, but that is an issue for Chapter 6.) The ordering does not imply anything in terms of differences in analytical centrality or theoretical importance of the factors.

a. *(Inter)subjective evidentiality as an additional qualificational dimension*
The literature on epistemic modality has it that there is a distinction between subjective and objective epistemic evaluations. Lyons (1977: 797ff) was probably first to introduce this distinction. According to him, objective epistemic modality expresses an objectively measurable chance that the state of affairs under consideration is true or not, while subjective epistemic modality involves a purely subjective guess regarding its truth. Consider (6).

(6) Alfred may be unmarried

In Lyons' view, (6) may either indicate that the speaker is simply uncertain about the (hypothetical) fact that Alfred is unmarried — i.e. subjective modality. Or, alternatively, it may indicate that according to the speaker there is a mathematically computable chance that Alfred is unmarried, for example because (s)he (the speaker) knows that Alfred belongs to a community of ninety people, of which there are thirty unmarried, hence there is one chance in three that he is unmarried — i.e. objective modality. In Lyons' conception, we are dealing here with two qualitatively different types of epistemic modality (and many have followed him in this assumption).

Clearly, if the latter were true, our assumption that expression types (2)–(5) in Section 1.3 form a semantic paradigm would already be facing a serious challenge. However, upon closer consideration Lyons' conclusion is not warranted. Surely, there is a strong intuitive appeal to the view that some epistemic judgments are subjective and others are less so (which no doubt explains why this distinction is so widely accepted in the literature). And this will indeed turn out to be a crucial dimension to understand certain usage properties of the expression types. But the nature of this dimension may be quite different from how Lyons characterizes it. A brief reflection on Lyons' explication of the two assumed readings of (6) soon reveals that his characterization is far from evident.[24]

What does 'being simply uncertain about a fact' (the presumed subjective meaning) mean? Any epistemic evaluation of the marital status of a person is at least based on the knowledge that in our society some people are

24. I am not aware of any better or more explicit characterization of the distinction elsewhere in the literature. In most cases the distinction is simply introduced by appealing to its intuitive plausibility, and without any further attempt to explicitly define it.

married and others are not, hence there is always a chance (even mathematical, if one happens to know the statistics) that Alfred is (un)married. Depending on how well one knows Alfred, there may be other factors codetermining one's judgment, such as knowledge about his age, his character (could anyone be willing to live with him), his lifestyle (is he always accompanied by the same woman or by different ones, or is he always alone), etc. So in this case, just as in the situation in which one knows that Alfred belongs to a community of ninety people of which thirty are unmarried, the judgment is based on some kind(s) of evidence. In principle, without any evidence one cannot evaluate the probability of the state of affairs: one can then only say that one does not know. Surely, people often express epistemic judgments which are not actually based on reasonable evidence at all. But by expressing the judgment they are nevertheless suggesting (or feigning) that they do have evidence for it. This is a matter of (in)sincerity: they are then misleading the listener.

What may vary, however, is the quality and/or the status of one's evidence for an epistemic judgment. Thus, one could reframe Lyons' distinction in terms of how convincing the evidence for an evaluation is: an epistemic evaluation based on better or stronger evidence is probably considered more objective than one based on shaky evidence. Hence, this element may play a role in the intuition that some epistemic expressions are more objective and others are more subjective. As will turn out in the analyses, however, a much more important element in this intuition appears to be a difference in the status of the evidence and the evaluation based on it from the perspective of the (knowledge of the) interaction partners in the situation. (This element is not incompatible with the previous one though, and maybe the two are relevant.) The alternatives within this dimension could then be phrased as follows: does the speaker suggest that (s)he alone knows the evidence and draws a conclusion from it; or does (s)he indicate that the evidence is known to (or accessible by) a larger group of people who share the conclusion based on it. In the former case the speaker assumes strictly personal responsibility for the epistemic qualification, in the latter case (s)he assumes a shared responsibility for it (although (s)he remains coresponsible too, of course). An important element in how this distinction actually works may then be whether the interaction partner belongs to those sharing the evidence and the conclusions or not. In fact, it is important to realize that the reflection of this dimension in epistemic expressions is a

matter of how the speaker presents it rather than of how it 'really is'. The position of the interaction partner can be expected to be critical in this respect.[25]

Now, note that this analysis involves two different (though related) semantic dimensions. On the one hand there is the speaker's evaluation of the probability of the state of affairs, i.e. the epistemic qualification. On the other hand there is his/her characterization of the status or quality of the sources (evidence) for that qualification, and this rather fits under the umbrella of what is traditionally called evidentiality (see Section 1.3). The dimension of subjectivity is thus not inherent in the epistemic domain, but belongs in the evidential domain. And we are not dealing with two types of epistemic modality, but with an interaction of an epistemic with an evidential qualification. 'Interaction' is a crucial term here (also to understand how Lyons' interpretation of the issue could have arisen): when the two dimensions co-occur in an utterance, they are structurally intimately intertwined, as we will see in the following chapters; and semantically, the evidential dimension not only affects the state of affairs, but also the epistemic qualification (not surprisingly, since it explicates the status of the information on which the epistemic qualification is based).

In order to avoid confusion with the traditional conception of the dimension of subjectivity, then, I will henceforth use the terms 'subjective' vs. 'intersubjective' evidentiality (rather than subjective vs. objective modality) to name the categories in this domain.

Clearly, in this reanalysis of the matter our definition of epistemic modality in Section 1.3 remains unaffected, and our paradigmatic approach is not in danger. Here are a few further considerations in support of this reanalysis.

First, although the range of the dimension of subjectivity requires further investigation, it appears to go well beyond epistemic modality. Thus, Lyons

25. Sanders and Spooren (1996) relate subjectivity with non-observable, knowledge-based evidence and non-subjectivity with observable evidence. In the present analysis this is not maintainable. Direct observation is more likely to offer good quality evidence than inferencing, but there is no necessary link. Directly observed evidence can be poor quality: e.g., getting a glimpse of something. And inferential evidence can be excellent, e.g. if the premises are based on good direct observation and the inference has been strictly syllogistic. And there is no apparent link at all between observable vs. knowledge-based evidence and the question whether this evidence is known to the speaker alone or is shared by more people.

(1977) argues that it also applies to the domain of deontic modality. And English (like many other languages) even appears to have independent expression forms for it: expressions such as *in my view/ opinion/mind*, *if you ask me*, *to me,* vs. *it is well known*, *you know* can be used to qualify information about a state of affairs as subjective or intersubjective even in the absence of any other (epistemic, deontic, or whatever) qualification in the utterance (cf. *if you ask me, Alfred is unmarried* vs. *we all know that Alfred is unmarried*).[26] Obviously, if (inter)subjectivity also occurs jointly with other qualificational dimensions, and even independently, it is more parsimonious to assign it the status of a separate qualification.

Second, the dimension of (inter)subjectivity, particularly when defined in terms of personal vs. shared responsibility, strongly reminds one of evidential(-like) dimensions observed in a number of quite different (mainly Asian) languages.[27] Hence our reanalysis brings this dimension in West Germanic in tune with a semantic category of wider typological significance. At least the following phenomena seem related: (i) The evidential category of 'prepared vs. unprepared minds' in Turkish (Slobin and Aksu 1982; Aksu-Koç and Slobin 1986), which signals experience which can vs. cannot easily be assimilated to existing assumptions and expectations in the language user's mind. (ii) The marking in Lhasa Tibetan (DeLancey 1986) and Chinese Pidgin Russian (Nichols 1986) of new experience not yet integrated in the speaker's mind versus old experience which has already become part of his/her knowledge. (iii) The 'habitual experiential' vs. 'gnomic' evidential categories in Sherpa (Woodbury 1986): the former indicates that the speaker has direct experiential evidence, the latter indicates that the speaker states something which (s)he has not directly experienced him/herself but which is generally known. (iv) The 'informal ending -*ô*' in Korean as discussed in Lee (1993): this form is used for information over which the speaker has exclusive authority, as opposed to other markers which indicate kinds of evidentiality for which the speaker is not solely responsible.

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26. See the papers in Stein and Wright (eds. 1995) on the pervasiveness of subjectivity in language, even if the notion is clearly not always used in the same way (in these papers, or elsewhere; see also below).

27. I see no typological correlates for the definition in terms of the (good vs. poor) quality of the evidence, however. This further adds to the impression that Lyons' original definition of the dimension of subjectivity is not really to the point. See Nuyts (2000b) for further discussion.

DeLancey (1997) argues that most of these observations (and many more in yet other languages) can be subsumed under the category of ‘mirativity’, involving the marking of information as new and unexpected. The relation to (inter)subjectivity is obvious (see also Nuyts 2000b).[28] Of course, in most or all of these cases, the evidential meaning has been described in terms of the speaker’s knowledge, while (inter)subjectivity as characterized above crucially involves the speaker’s assumption about the hearer’s knowledge. But maybe this interpersonal dimension is present in (some of) these languages as well, but has simply not been observed yet. Choi (1995), for example, has argued that it is indeed very important in Korean evidential marking of old vs. new experience.

A third, and probably the most important, argument favoring the given reanalysis is the fact, to be substantiated in the following chapters, that the element of (inter)subjectivity is not consistently present in all expressions of epistemic modality, contrary to what one would expect if it were a matter of two types of epistemic modality (in the latter case, each instance of an epistemic expression should either be subjective or objective). One of the weaknesses of the classical analysis of subjective vs. objective modality is that it has never clearly been shown how the distinction relates to specific expression types. Lyons himself remains vague in this regards. Others have tried to be more precise (specific proposals will be discussed in the following chapters), but with very contradictory (and often questionable) results. Part of the reason is no doubt that they have been forced to look for distinctions where there are none to be found. There have also been different suggestions in the literature about relations between the two modality types and several distinctive behavioral properties of expression types, including differences in the interaction with negation and tense, and different possibilities in the context of questions and conditionals (see, e.g., Lyons 1977: 799; Perkins 1983: passim; Hengeveld 1988: 236ff). As I have argued at length elsewhere (Nuyts 1992a), the suggested links are questionable, and the next

28. DeLancey (1997) argues that mirativity constitutes a system distinct from, even if intimately related to, real evidentiality (the marking of types of information sources). This means splitting up evidentiality as a cover notion for everything to do with sources of information into finer categories. I will not take issue with this here. For the present purpose I will stick to the global notion of evidentiality and handle (inter)subjectivity as a subtype of it. See also Section 6.6.

chapters will reveal that most of these behavioral properties have little or nothing to do with the matter of subjectivity of expressions.

One should actually not confuse the present notion of subjectivity with that figuring in Langacker's (1990) concept of 'subjectification'. The latter has to do with the extent to which the 'ground' (i.e. the speech event, the interlocutors, and their immediate circumstances) is present in a linguistic expression: the object or event described is maximally objective and the ground maximally subjective if the ground is completely implicit in the expression; and their respective objectivity and subjectivity diminishes with an increasing presence of the ground in the expression. As Langacker (1990: 6) states, he uses these terms "in a special, technical sense — though related, their values will not be taken as equivalent to those implied when speaking of a judgment being subjective vs. objective (i.e. 'personal, idiosyncratic' vs. 'impartial, based on solid evidence')". How his notions relate to the present ones is unclear, however. For example, Langacker relates subjectification with grammaticalization, hence in his view the English modals are highly subjectified (he calls them 'grounding predications'). Yet, as we will see in the next chapters, in the present analysis the modals are not subjective at all. The mental state predicates, on the other hand, are less grounded hence less subjective in Langacker's analysis, but in the present analysis they are highly subjective.

The present notion of subjectivity should also not be confused with that involved in Traugott's (1989, 1995, 1997, among others) concept of 'subjectification' in language change, although here the link is much more obvious. Traugott's concept refers to the trend in grammaticalization processes, but also in lexical change, for forms to develop from meanings related to representing the object world to meanings rendering the speaking subject's attitudes towards (or his/her manipulations of the representation of) that object world. As such, it clearly relates to a concept to be discussed at length in Chapter 6, viz. that of the hierarchical ordering of qualifications.[29] The present notion of subjectivity, then, is much narrower that Traugott's, but they are linked in that the present dimension of (inter)subjectivity is very

29. Again, Traugott's notion is somehow akin to Langacker's, but the overlap is far from complete (cf. Traugott 1995) and the precise relation is far from obvious. But see Carey (1995) for an attempt to explicate the relation.

high on the scale of subjectivity in Traugott's sense. I return to this in Chapter 6.

b. *Performativity vs. descriptivity*
As suggested in the definition of epistemic modality in Section 1.3, one can distinguish between expressions of epistemic modality which involve the speaker's own current evaluation of a state of affairs, and such which only report on an epistemic evaluation without the speaker subscribing to it him/herself. (7), for example,

(7) I think they have run out of fuel

expresses an epistemic evaluation of a state of affairs which the speaker has performed him/herself and to which (s)he is fully committed at the moment of speaking. This is quite unlike the utterances in (8) and (9).

(8) John thinks they have run out of fuel

(9) I thought they had run out of fuel

In (8), the speaker is reporting on another person's evaluation of the state of affairs, but there is no indication whatsoever of commitment to it on his/her own part. (9) reports on an epistemic evaluation of the state of affairs to which the speaker was committed sometime in the past, but leaves open whether (s)he still is at the moment of speaking.

Expressions which report on an epistemic qualification of a state of affairs without involving speaker commitment to it at the moment of speaking, such as (8) and (9), will be called 'descriptive'. (As the following chapters will show, the category of descriptive uses extends beyond cases such as (8) and (9), however.) Epistemic forms which express the speaker's current attitude towards the state of affairs, i.e. which do involve his/her commitment to the qualification at the moment of speaking, as in (7), will be called 'performative'. The performative use of epistemic expressions is the default, it is in terms of the possibilities for descriptive uses that the expression types will turn out to differ.

Again, this distinction does not involve two types of epistemic modality: for both variants the definition in Section 1.3 holds. Hence it does not endanger our paradigmatic approach sketched in Section 1.3. As I will argue in Chapter 6, however, the distinction does involve a basic difference in the conceptual status of the epistemic qualification. The essence is this: As stated

in Section 1.3, an epistemic evaluation is metarepresentational, it resulting from a process of reflection over knowledge about a state of affairs. Performative evaluations, then are the direct result of such a reflectional act by the speaker, but descriptive ones are not. In the speaker's mind a descriptive evaluation is really a state of affairs itself, albeit of a special nature: it remains a qualification of another state of affairs, of course.

This distinction between performative and descriptive uses is again by no means limited to the domain of epistemic modality: it can also be found at least in the domains of deontic modality, evidentiality, and emotional attitude (see Nuyts 1990b). More on this in Section 6.6.

The present categories of performative and descriptive uses may seem similar to Sweetser's (1990: 65ff) 'imposing' vs. 'reporting' or 'describing' uses of modal forms (specifically: auxiliaries). Yet these issues are quite different and should not be confused. Sweetser refers to the difference between cases in which the speaker imposes the modal qualification upon the listener and cases in which (s)he only reports it to the listener. This is comparable to the presence vs. absence of a perlocutionary goal in terms of speech act theory. This contrast may be relevant in the deontic domain, but it is much less useful in the epistemic domain. In fact, in Sweetser's analysis epistemic modals can only be used to describe or report, not to impose. In any case, describing or reporting in Sweetser's analysis certainly does not translate into descriptivity in the present analysis (in fact, in the current analysis the modals are exclusively performative — see Chapter 4).

The present notion of performativity should also not be confused with that in speech act theory. There is a clear correspondence between the two: both involve a phenomenon in which something is performed here and now and this performance is expressed by means of some lexical element. But there is a clear difference in what is performed: a verbal act toward the listener, versus a mental act of evaluation of a state of affairs. The former only exists by virtue of the utterance: it is through the utterance that the speech act is performed. The latter, however, can exist without the verbal expression: the verbal act only expresses the mental act, without being constitutive of it. One can perform the act of (conceptually) evaluating something without expressing it. This has considerable consequences for understanding the two phenomena and the behavior of the linguistic expressions involved. In fact, the speech act theoretical concept of performativity cannot easily be applied to epistemic and other qualificational expressions:

Bartsch (1972) has tried to do so, but Lang and Steinitz (1977) have shown why this is problematic (see also Doherty 1985: 25ff).[30]

c. *Information structure*

A dimension which is largely absent in studies of epistemic modality (with a few exceptions, including Plank 1981: 65ff), yet which any astute functionalist would immediately suspect to play a probably quite important role in modal expressions (as in any paradigm of linguistic expression types for that matter), is information structure. By this I mean differences in the status (the importance) of parts of the information in the utterance — here the epistemic qualification vs. other elements — in view of their role in the current discourse context. One quite important element of this is the relative state of knowledge of the interaction partners.

Of course, information structure has been observed to play a role for the scope of epistemic (and other qualificational) expressions. It has been argued that such expressions normally do not affect the entire utterance: rather, they affect only the newly asserted part of it, and not the old or presupposed part (cf., e.g., Lang 1979 and Verhagen 1986 on epistemic and other adverbials in German and Dutch, or Givón 1984 on negation). This principle is no doubt essentially valid, even if probably too simple, in at least two respects. First, one must sometimes take recourse to the interlocutor's utterance. Thus, speakers may use an epistemic or other qualificational expression in isolation, in the absence of any other asserted information (examples will be given in the next chapters). This usually happens in reaction to an expression by the interlocutor, and in such cases the qualification probably affects the asserted information in the interlocutor's utterance. The same may be true when the epistemic expression itself is focal (see below). Verhagen (1986: 161–162) assumes that the rest of the utterance is then always given information. If so, then scope must probably be defined again in terms of

30. This might be a reason to avoid the term 'performativity' here, but the problem is that there are no good alternatives. 'Mention' (for 'descriptivity') versus 'use' (for 'performativity') might seem to do the job. But this terminology has been used for yet another purpose which does not conform to the present (cf. Sperber and Wilson 1981). And it leads to formulations which are confusing (cf. the often unwanted ambiguity in statements such as 'the use of the modal adverb') or unattractive (cf. the stylistic oddness of 'the use use of the modal adverb'). On the other hand, using the same term does have the advantage that it signals the fact that the basic mechanism underlying these phenomena is probably identical in both (see Section 6.6).

what was newly asserted in the interlocutor's utterance. Second, the principle is probably not always applicable. As the following chapters will show, an epistemic qualification sometimes has scope over backgrounded information but not over the main body of asserted information in the utterance.

But that aside, this principle does not appear to discriminate between the different epistemic expression types. In general, the scope extension of epistemic and other qualificational categories in an utterance can differ considerably, but this is true for any expression type. So there is little reason to believe that this dimension structurally influences the speaker's choice for one of the alternative form types.[31] It will therefore not figure centrally in the data analyses in the next chapters (although it will show up repeatedly in the discussions; matters of scope in general will also figure centrally in Chapter 6).

What **does** discriminate between expression types, and will even turn out to play a quite remarkable role in them, however, is the question what informational status the epistemic expression itself can have in the context of the utterance. The analysis of this dimension is a tricky matter though, for several reasons.

Information structure and its effect on linguistic structure in general has of course been subject to intensive study for a long time already (at least since the introduction of 'functional sentence perspective' in the Prague School; and see, e.g., Givón 1984, 1990, Chafe 1994, and Lambrecht 1994 for recent analyses). There is no functionalist grammar theory which does not feature a battery of notions to characterize this dimension, including topic vs. focus or comment, theme vs. rheme, given vs. new, presupposition vs. assertion, and background vs. foreground. But these notions have been defined in quite different ways in different theories, even to the point that intertheoretical comparison becomes very difficult. The existence of so many different terms, and of such profound differences in their definition, is symptomatic for the fact that there is little consensus regarding how information structure should be analyzed.

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31. There may be a few circumstances in which the scope of the epistemic qualification could influence the choice of an expression to some extent. Specifically, when the qualification does not affect the main body of the utterance but only a secondary (often parenthesis-like) element in it, if that element does not contain a predicate, use of a modal auxiliary appears impossible for formal reasons. Such cases are marginal, however.

Obviously, unraveling the differences in existing analyses and solving the question which of them are adequate would require a concern with empirical and theoretical matters far beyond the present topic. Yet for our present purposes we do need a terminological apparatus. Rather than immediately introducing a full-fledged analytical framework, then, I will start out with a very simple, nearly pre-theoretical characterization of one essential dimension, which will allow us to make the necessary surface distinctions in the data. Thus, as will turn out, to characterize the (quite remarkable) position of epistemic modal expressions in information structure we need just one global analytical category, viz. that of focal information. For the time being, let us define 'focus' in quite simple intuitive terms, as the informationally most important element in an utterance which therefore may (but need not) receive linguistic prominence through one or more grammatical devices, including intonation, special word order (e.g. sentence-initial position), and special syntactic constructions (e.g. clefts). (This corresponds to the definition of focus in Dik's 1989a: 265ff, 1997a: 326ff theory of Functional Grammar.) Information can probably gain central importance for various reasons (see Section 6.5), hence this notion of focus is a rather superficial one covering or resulting from various deeper dimensions (including newness, contrast, etc.). The question how this works will be taken up in Chapter 6. In the mean time, our observations in the empirical chapters will allow us to gradually build up a finer view of what focus in epistemic expressions means, both in terms of its expressive devices and its deeper informational status.

In those empirical chapters, then, the relevant question will be whether the different epistemic expression types allow the epistemic qualification to occur in focus, and if they do, how frequently this happens. As will soon become clear, however, it is not always easy to firmly answer this question, and especially the second part of it. We will have to combine our intuitive semantic interpretation of cases with an application of various formal criteria which can be related to focality of information (to be introduced in the course of the analyses). But even then some degree of indeterminacy will remain, and our findings will have the nature of tendencies rather than clear distinctions. This is partly inherent in the subject matter: focality is fundamentally a matter of degree rather than binary options. But another major reason will turn out to be that many linguistic devices traditionally associated with the expression of focality (intonation, syntactic devices), which might

therefore have served as diagnostic means in the analyses, sometimes function differently in epistemic expression types. This does not invalidate the link between these devices and focality of information, it only means that the semantic domain of epistemic modality is probably deviant in this regards. (And it may not be alone in this: cf. Chafe's 1994 unexplored suggestion that there is a range of 'regulatory' units — as he calls them — in linguistic structure which escape the normal information-structural principles applicable to the expression of information about the world). More on this later.

d. *Discourse strategy*
It has repeatedly been observed that epistemic expressions are often used to achieve special effects in discourse (e.g., Perkins 1983: 116ff; Coates 1987). Speakers use them to make different types of 'strategic' adjustments to an utterance, in function of their interpersonal relationship with the listener/reader (e.g., for reasons of politeness, in order to boast or appear modest, in order to downplay matters, etc.), and/or in view of the properties of the actual discourse situation. Such uses will be covered here under the term 'discourse strategy'. The present analyses will confirm that this dimension is relevant to understand certain uses of (some of) the epistemic expression types.

It should be obvious that none of these four factors (a)-(d) is specific to linguistic expressions of epistemic modality: each of them has wider applicability in language use (although they will turn out to have features and realizations which are specific to this semantic domain). Also, each of these factors has a clear identity in relation to the others: they involve quite divergent aspects and elements of language use (which does not mean that they are entirely independent of each other: on the contrary, some of them will show clear relations and interactions). As foreshadowed in Section 1.3, these are important observations in view of the viability of our paradigmatic analysis and its theoretical interpretation later.

Apart from these four factors, the choice between expression types may actually to a limited extent also be due to an element internal to the epistemic qualification as such, notably the 'precision' of the epistemic expression (although it will turn out that even this is not entirely independent from some of the functional factors introduced above). This element will be discussed during the presentation of the grammatical and lexical-semantic properties of the expression types, which will each time precede the analysis

in terms of the above factors. It will not cause a split in the semantic core notion of epistemic modality either, however (see Section 6.1).

1.5 Data types and languages

In terms of its empirical basis, this investigation will primarily involve a detailed scrutiny of materials from a corpus of naturally occurring present-day spoken and written language, combined with intuitively constructed examples, and to a limited extent complemented with diachronic and experimentally elicited data.

The main orientation towards corpus data may not be surprising in view of the functional linguistic roots of this investigation. But there is more to this choice than just disciplinary background.[32] As mentioned in Section 1.3, epistemic expressions have proven to be highly complex, subtle and evasive. A particular problem is that they constantly tend to escape the grasp of one's intuitions for what is possible or appropriate, and why. Therefore, the practice common in certain branches of linguistics to rely exclusively on intuitively constructed examples is highly inadequate for our present purposes (although all too many investigations of epistemic modality have been conducted on this basis).[33] Here even more than for simpler linguistic phenomena, it is absolutely essential to observe how the relevant expressions behave in real and sufficiently varied contexts. And (contrary to

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32. As should be obvious from the foregoing, I do not share the attitude not uncommon in corpus linguistics that all there is to good research is a careful study of the data, which will automatically generate the theory (if the latter is needed at all). Such a radically empiricist attitude (it comes in degrees, of course) is unfruitful, as it does not allow the formulation of critical research issues such as in Section 1.2. And it is not maintainable, for any data analysis unavoidably implies a categorization of data, which necessarily goes beyond pure empiricism. The belief that analytical categories emerge from the data all by themselves is a dangerous illusion: data do not speak, they can only be interpreted. Even radical empiricists do introduce categories (often unwittingly), but these run the risk of being ad hoc because they are not motivated by a global perspective (a theory) on the subject matter. As the present investigation will hopefully demonstrate, good science requires combination of a strong commitment to data with a clear theoretical view of the matter.

33. Full reliance on constructed examples is, of course, a risky method for investigating any type of linguistic phenomenon, even a purely syntactic one. See Chafe (1994), Nuyts (1992b: 120ff, 1996a).

another traditional bias in linguistics — cf. Linell 1982) not only in written language, but also in spoken data, which usually reveal the range of possibilities of the linguistic system much better. (On the corpora used here, see Section 1.6.)

Of course, corpus data do have their limits, as they are vulnerable to purely accidental gaps: possibilities which happen not to occur in one's corpus. The larger one's corpus, the smaller this risk. But there are limits to the amounts of corpus data one can reasonably process if they are to be analyzed in-depth. Moreover, some features of a phenomenon may be so rare that even very large corpora do not reveal them. And frequency of a feature does not necessarily correlate with its importance for understanding the matter, especially in case of a highly complex phenomenon such as the present. Therefore, it is unavoidable to complement the corpus investigation with a careful use of invented examples and one's intuitions about what is structurally, semantically, and contextually possible, in spite of their instability in this domain.[34] (See Section 1.6.)

Apart from synchronic data I will also, to a limited extent, use historical materials (which are in a way naturally occurring data too, of course). In the spirit of the dynamic perspective on language (cf. Section 1.2), they will serve to support and further clarify some of the trends that will appear from the synchronic data analysis (see Sections 4.7 and 6.1). Information on the historical data sources will be given in due course.

A complementary way to proceed is through experimental investigation. Apart from rare exceptions (e.g., Miller and Kwilosz 1981), epistemic modality has hardly received attention in experimental psychology, probably due to the evasiveness of the phenomenon. To the extent that the present corpus investigation leads to sufficiently concrete hypotheses, it would be useful to test them and possibly refine them by means of experiments. Yet, not surprisingly, the complexity and subtlety of the analysis will prove concomitant to the complexity of the phenomenon itself, and this makes experimental investigation often very difficult. In practice, then, the present study will feature an experimental analysis of only one of the factors in the

34. Of course, it is an illusion to think that one can ever do without intuitions in analyzing corpus data anyway: even for actually occurring cases, intuitions are crucial to understand what they stand for, and what they may reveal about the issue under investigation.

corpus analysis (albeit one of the most interesting and special ones), viz. information structure. And even this investigation is not very technical: it involves controlled data elicitation, for hardcore experimentalists no doubt a fairly primitive kind of experimentation.[35] Details will be provided in Chapter 5.

In the corpus investigation, in order to keep the amounts of data within manageable limits, I will not explore all lexical items in each epistemic expression type, but I will restrict the in-depth analysis to one specific lexical item per expression type per language (see below on the languages). The choice of items and the motivation for it will be spelled out in the chapters below, but the major criterion will of course be representativity for and/or centrality to the entire category. Nevertheless, some risk of bias due to idiosyncratic properties of the chosen lexical items remains. Thus, ideally, the investigation should be replicated for some or all other lexical forms per expression type. I will obviously keep an open eye on this problem, and this will be one of the ways in which intuitions have a considerable role to play. Moreover, the experimental investigation will cover all forms in each of the expression types, so at least for the factor of information structure we will have a means to check the general applicability of the corpus findings.

A word regarding the choice of languages is in order as well. Of course, the paradigmatic approach requires a comparison of the alternative expression types within one language; but comparing full paradigmatic analyses across languages is highly desirable. As indicated above, the present investigation will focus on three West Germanic languages, viz. Dutch, German and English. This choice is determined by the present author's familiarity with them: in view of the subtle and elusive nature of the subject matter, native or near-native intuitions are indispensable. The actual corpus investigation will involve Dutch and German data, the experimental testing and historical excursions will focus on Dutch only. For English only constructed examples will be used, so I cannot make equally detailed claims regarding the status of the expression types in this language. For the sake of simplicity English will often figure as the language of presentation, however: corpus-independent discussion of properties of the expression types will refer to

35. Jointly with Wietske Vonk, I am currently further elaborating the experimental testing of the findings of the present corpus-based investigation.

constructed examples in English only, unless there are relevant differences between the languages considered. Overall, the general principles of the analysis will turn out to apply consistently across the three languages, even though there are quite a few differences in the details.

Clearly, confinement to these three languages puts limits to the interpretability of our findings: they are typologically so close that one cannot conclude anything regarding the universal validity of generalizations based on them. The present paradigmatic investigation is thus in need of replication for many more languages, especially typologically substantially different ones. This is a difficult task, however, because it requires a good intuitive feeling for the language one is dealing with. This is a systematic obstacle for typological research on subtle linguistic phenomena. Standard descriptive grammars of 'exotic' languages usually do not provide detailed information on the semantics, let alone the usage properties, of, e.g., epistemic expressions. And to the extent that they do, it should be handled with care since the authors are hardly ever native speakers. (This is not a criticism, just an observation regarding the limits to what a field researcher globally describing an unknown language can possibly do in a complex area such as this.) Hence, a typological survey based on descriptive grammars, common in studies on morphology and syntax, is highly problematic for our present case. It may be feasible as long as one is looking for global structural properties of expressions based on rough semantic divisions (as is true for much of the research on grammaticalization, or for Palmer's 1986 typological survey of the modalities as a general category, e.g.). But it is no longer feasible if one aims at semantic and discourse functional details (as is needed for the present investigation). Getting a typological perspective on the present investigation, then, will require an enormous amount of further detailed, dedicated, in-depth research on many individual languages of the world, preferentially by native speakers of those languages.

In the absence of this typological perspective, the present investigation must remain tentative in terms of what it can say about the principles of cognitive representation and processing of epistemic modality. It does potentially reveal one way in which the cognitive infrastructure dealing with it may be organized and function, viz. in speakers of the most important West Germanic languages (even though typological findings may force adjustments even in this regards). To the extent that their cognitive infrastructure inherits what is universal to all human minds, then, we must

somehow hit upon features of universal relevance. That is, at least at a sufficiently high level of generalization we will no doubt come across basic elements which may reasonably be expected to be universal. But it will be strictly impossible to say precisely where or how this applies, and the truth of any claims in this connection will always remain subject to further research. This matter brings up a very important issue for present day linguistic research, yet one which has received far too little attention, viz. the relationship between and mutual impact of typology and cognition, and between/of cognitive research and typological research. I will return to this in Section 6.5.

1.6 Practical details about the data and their analyses

Finally, here is some practical information about the data and their use in the analyses.

Table 1 gives an overview of the corpora and their size (the number of words in them). I have used two existing corpora of present-day Dutch: the ‘Uit den Boogaart’ corpus (UDB, Uit den Boogaart 1975), and the ‘Vandenbosch’ corpus (VDB, Vandenbosch 1992).

Table 1. *Word counts for the corpora*

	Dutch — UDB		Dutch — VDB		German	
Written	newspapers	120,313	expository	52,266	newspapers	137,062
	political mag.	123,873	literary prose	42,556	magazines	278,841
	family mag.	119,325			pop. science	141,830
	pop. science	119,979			literary prose	193,520
	literary prose	122,243				
Spoken	academic	65,844	global	91,623	global	227,881
	non-acad.	55,725				
Total		727,302		186,445		979,134

– UDB contains 5 subcorpora of written language, each with data from a different source type: newspapers (extracts from newspaper reports of different types — world news, local news, sports), political magazines (extracts from different types of reports and/or comments on news topics), family magazines (extracts from informative articles on health issues, tourism, fashion, hobbies, etc.), popular scientific publications, and literary prose. There are 2 subcorpora of spoken language, viz. (sections from) interviews (on all kinds of issues of general relevance) with academics and with non-academics.
– VDB contains 2 written subcorpora: one of literary prose and one of expository prose (mainly popular scientific texts, and a few sections from articles in newspapers and political magazines). The spoken subcorpus involves conversations on political or social news, on topics of public concern, or on cultural matters (in the broadest sense, including sports, entertainment, etc.), all taken from interviews, debates, talk shows, etc. on TV.

The German data are drawn from the corpora available at the Institut für deutsche Sprache in Mannheim. The selection is motivated by comparability with the Dutch data. The expository parts of the written data are a selection from the 'Mannheimer Korpus 1' (MK1) and the 'Handbuchkorpus 1987' (HBK), and include texts from newspapers (news items of different kinds), general magazines (including articles on political matters, economy, culture, social items, entertainment, health issues, etc.) and popular scientific journals. The literary part is a selection of literary and pseudo literary novels from the 'Grammatikkorpus' (GTK). For the spoken data I have used the entire 'Dialogstrukturenkorpus' (DSK), composed of interviews and discussions on political or social items (partly from German TV and radio, partly from other sources), and of conversations during counseling sessions ('Beratungsgespräche', e.g. with a psychologist on German radio, with a dentist in his office, with a student advisor at the university, etc.) and examinations at the university (these latter conversation types are absent in the Dutch data).

In the analyses I will not maintain the fine distinctions between textual categories in these corpora (which are from a text-typological perspective quite problematic anyway). An investigation of the effects of discourse types on the properties of epistemic expression types would be an interesting

enterprise, but is (apart from some general observations) beyond the present aims. My interest is with the global properties of epistemic expression types, and a rough division such as in the VDB-corpus is sufficient for that purpose. I will therefore reorganize UDB and the German corpus along the lines of VDB. Thus, texts from newspapers, political, family or general magazines and popular scientific works will all be labeled as 'expository prose'.[36] Also the distinction between academic and non-academic interviews in UDB will not be used. In the presentations I will furthermore not distinguish between UDB and VDB: the label 'Dutch corpus' will cover the two.

I will not always use all materials. My main interest is with an in-depth qualitative analysis of the expressions. From that perspective, the large proportions of the corpus are an advantage for infrequent items, but lead to an unmanageable number of cases for regularly occurring items. I will therefore not use more corpus materials than needed to get a reasonable number of instances of an expression type. When limiting the amount of data, then, I will first of all exclude literary prose, which is most difficult to situate in terms of textual properties: some (parts of) texts are more like expository prose, some more like spoken language. For the other categories, an arbitrary selection will be made from the different subcorpora (for details, see the individual analyses). Among the Dutch corpora, VDB is better suited for our purpose than UDB (UDB was actually compiled for lexicographical purposes) because it contains much longer stretches of continuous discourse. So I will primarily use VDB, and to the extent needed I will add subparts of UDB. I will only use the spoken parts of UDB if really necessary to get a reasonable number of cases. The reason is that this spoken subcorpus is very poorly transcribed (no clause or utterance boundaries, pauses, stress, etc., and, even worse, no questions, remarks, interjections, etc. by the interviewer), which makes cases often hard to interpret. The spoken parts of VDB unfortunately have no indication of intonation either, although this would have been very useful for the analysis of information structure (but it does contain pauses, overlaps, repetitions, backchannel cues, etc.). (I know of no Dutch spoken corpora which do mark intonation.) The transcripts in the

36. Uit den Boogaart (1975: 25) himself observes that these subcorpora are generally very similar as compared to the categories of literary prose and spoken language, in terms of the quantity and quality of the lexical items used and their grammatical features.

German DSK are fairly detailed, indicating pauses, overlaps, etc., prosodic features such as falling, flat or rising intonation at the end of phrases, (relative) slowing down or speeding up of speech, speech intensity, and heavy stress. But even then, there is no systematic indication of primary or secondary sentence stress, for example.

For a significant sample of Dutch corpus cases for each expression type, my interpretation has been double-checked by a knowledgeable and critical observer (Ann De Roeck — with many thanks). Disagreements turned out to be minor, and were nearly always solved after discussion. Unfortunately, I have not been able to do the same for the German data.

Non-interpretable cases in the data have been excluded from the analysis, as have been incomplete constructions (including false starts), unless they were sufficiently developed to make them further analyzable.

In the quantitative tables in the next chapters, the following abbreviations will be used. The text categories: 'EXP' for expository prose, 'LIT' for literary prose, 'SPK' for spoken language. The quantitative information: 'n' for absolute counts, '0/0000' for numbers of occurrences per 10,000 words; 'share' for the relative share or proportion per 100 occurrences of the compared alternatives.

Since the different textual categories in the corpora have a different size (see Table 1), and since different amounts of data are used for different expression types, all quantitative comparisons will have to be based on percentage counts.

It is notoriously difficult to find suitable methods for statistical analysis of corpus data. For example, it is only legitimate to use a standard test such as χ^2 if the amount of data taken into account remains stable. But this is not the case in the present investigation. I will therefore refrain from using any statistical methods: interpretation of quantitative data will be done 'in sober reason'. The (usually) large quantities of data queried make this task easier, however, as it improves the chances that reasonable differences are relevant.

Examples to be quoted from the spoken corpora are often cleaned up or simplified by omitting pauses, hesitations, repetitions, slips of the tongue, backchannel cues, prosodic information, etc., unless they are relevant for the discussion, of course. In the transcriptions of German spoken data there is (contrary to German spelling conventions) no capitalization of nouns and (also in the Dutch spoken data) punctuation is kept to a minimum, (more or less) respecting the speaker's actual prosody.

At the cost of a slight decrease in reader-friendliness, the relevant epistemic forms in the examples will not be formally highlighted, so as to preclude any unwanted effects on the interpretation of intonation and stressing.

English translations of Dutch and German corpus examples will not always be stylistically optimal, but they are intended to render the original as closely as possible (the Dutch and German examples themselves — especially spoken ones — actually often do not accord to normative school grammars either). Even then, the translation will not always be completely faithful to the original. So one should be very careful when using the English translations in the interpretation of examples.

Finally a few words regarding the constructed examples used to complement the corpus data. An asterisk or a (double) question mark in front of such examples will mean that using the construction is considered impossible or (highly) unlikely, either in the specific circumstances under consideration, or in all imaginable circumstances (the discussion will make clear which is meant). This evaluation is, thus, always a radically pragmatic one (i.e., involving the question whether the form can be used or not). The reason for the impossibility to use a construction can be syntactic, semantic or discourse organizational (or a combination of them), but it may sometimes be very hard to determine which of these applies. In the overwhelming majority of cases to be considered, however, the reason will turn out to be clearly semantic and/or discourse organizational. In any case, in interpreting judgments of examples, it is important not to focus on the syntax alone, because that may often lead to a mistaken or biased interpretation of the evaluation.

As stressed before, intuitions on epistemic expressions turn out to be highly unstable. In several instances, I have therefore checked my own intuitions regarding constructed examples against those of a number of (linguistically knowledgeable) native informants, especially for German and English (for which I am not a native speaker). (Many thanks to all of them.) As it turns out, however, the results of such queries are often inconsistent. So, unavoidably, not everyone will necessarily agree with all the evaluations presented here (whenever I know of disagreements, I will explicitly mention or discuss them). Anyhow, this means that evidence drawn from constructed examples is sometimes rather tentative, and I will handle it correspondingly. I should stress, however, that conclusions about major properties of expression forms will never depend on constructed examples alone, but will always primarily be based on observations regarding the corpus data. In fact,

conclusions will never depend on just one feature or property of the expression forms, but will emerge from a whole cluster of them. Constructed examples will therefore always figure in the context of a much wider range of observations, of which most are corpus-based, and what counts is the overall pattern emerging from the full range of presented facts.

Chapter 2

Modal adverbs and adjectives

2.1 Some lexical-semantic and grammatical properties

In line with the discussion in Section 1.3, let us start with a comparative analysis of the epistemic modal sentence adverbs, as in (10), and the predicative epistemic modal adjectives, as in (11).[1]

(10) Probably they have run out of fuel

(11) It is probable that they have run out of fuel

As argued, in West Germanic these may be considered the 'purest' expressions for epistemic modality, in the sense that they are the most precise and specific means available for marking the degree of likelihood of a state of affairs: on the epistemic scale, *certain*(*ly*) is at the extreme positive end, *probable*/*probably* is more or less in the middle on the positive side of the scale, *possible*/*possibly* is near or at the neutral point, in the middle between the positive and the negative side of the scale, etc. This does not mean that there cannot be any variation in the degree of likelihood expressed by these forms, depending on contextual circumstances. But this is relatively minor, as compared to other expression types such as the mental state predicates.

The epistemic adverbs and adjectives are closed classes, i.e. they consist of a fairly stable and delimited set of forms. The two classes overlap, yet are not identical. The class of adverbs is larger, which no doubt relates to the

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1. These adverbs and adjectives can also be used at the term level: cf. *John is a probably too weak candidate*, *John is a probable candidate*. The Dutch and German corpus data indicate that so used these forms often have no epistemic meaning anymore, and Chapter 5 will show that epistemic uses of term adverbs and adjectives in Dutch are very rare. So I will limit my attention to sentence adverbs and predicative adjectives here. Hence, when I use the notions 'adverb' and 'adjective' below, I mean 'sentence adverb' and 'predicative adjective', unless indicated otherwise.

fact that adverbs are used more frequently than adjectives (see below). The classes are actually remarkably comparable across the three languages considered here. Thus, for the neutral position, besides the adverb and adjective (English) *possible*/*possibly*, (Dutch) *mogelijk*/*mogelijk(erwijze)* and (German) *möglich*/*möglicherweise*,[2] each of these languages has one or two alternative adverbial forms (which have no adjectival use), viz. English *maybe* and *perhaps*, Dutch *misschien*, German *vielleicht*. For the middle position adverb and adjective *probable*/*probably*, *waarschijnlijk*, *wahrscheinlich*, English has an adjectival alternative, *likely*, and Dutch has two adverbial alternatives, viz. *wellicht* and *allicht*. For adverbial and adjectival *certain*/*certainly*, *zeker*, *sicher*/*sicher(lich)*, each language has a few adverbial alternatives, viz. English *undoubtedly* and *surely*, Dutch *ongetwijfeld* and *vast*, and German *zweifelsohne* or *zweifellos* and *bestimmt*.

The difference between alternative forms may sometimes be a matter of slight differences in the strength of the epistemic evaluation: e.g., *maybe* seems somewhat stronger than *possibly* (the same goes for the German and Dutch equivalents), and Dutch *wellicht* is probably weaker,[3] but *allicht* is rather stronger than *waarschijnlijk*. But the major element behind the existence of alternatives is regional and/or stylistic variation. This is for example no doubt true for English *certainly*, *surely* and *undoubtedly* (and probably also for their Dutch and German counterparts), or *maybe* and *perhaps*, and it is also part of the explanation for the difference between Dutch *waarschijnlijk*, *wellicht* and *allicht*.

These languages also have a considerable number of adverbs and/or adjectives which in the present analysis are considered evidential rather than epistemic, such as *seemingly*, *apparently*, *clearly* (and their Dutch and German counterparts). The borderline between epistemic and evidential forms may not be sharp, however, to the extent that some forms might be both epistemic and evidential. Examples are English, Dutch and German

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2. Unlike English, Dutch and German normally do not morphologically mark the difference between the adverbial and the adjectival form. However, for this specific lexical item there is a tendency in Dutch and a near obligation in German to mark the adverbial form, viz. *mogelijkerwijs*, *möglicherweise*.

3. According to the standard dictionary of Dutch (*Van Dale Groot Woordenboek der Nederlandse Taal*), *wellicht* is equivalent to *misschien*. Yet, at least in Southern Dutch, in actual use it is clearly stronger than the latter.

adverbial *presumably*, *vermoedelijk*, *vermutlich*, and Dutch and German adjectival *aannemelijk*, *annehmbar*. These forms express inference as an evidential dimension: they all somehow mean that 'from what is known it can be inferred that …'. But at the same time they seem to express an epistemic evaluation as well. Whether this epistemic meaning is inherent or only inferable is a matter for further analysis, I will not go into it here.

In terms of syntax, the adjectives, as predicates, have a fixed position in an utterance. But the adverbs have the reputation of being very loose, 'floating' elements, since they can take many different positions in a clause, in Dutch and German even more so than in English. This does not mean their exact positioning is random: it is guided by principles such as their exact scope over information (see, e.g., Verhagen 1986 on Dutch; see also Section 2.4h below). But nevertheless, their multiple positionability and 'free' nature is a significant feature, to which I will return repeatedly in this and the following chapters.

Despite the difference in syntactic status, the lexical correspondence between the expressions in (10) and (11) has led some (e.g., Perkins 1983) to suggest that semantically the adverbs and adjectives may be more or less equivalent. However, upon closer scrutiny there turn out to be several clear differences (cross-linguistically) in the semantic-syntactic behavior of these two form types, which make such an assumption quite tenuous. Among the differences first observed and most often cited in the literature are their behavior in questions and the (non)existence of negative forms.

a. *Questioning*

It appears that modal adjectives can be questioned, whereas modal adverbs cannot (Jackendoff 1972: 84; Bellert 1977: 344; Lang 1979: 207; Foley and Valin 1984: 220; Hengeveld 1988: 236). Thus, (12) is perfectly acceptable, whereas (13) seems impossible.[4]

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4. On how to interpret an asterisk in constructed examples, see Section 1.6. The utterances in (13) are impossible for information-structural reasons, as I will argue later in this chapter. Still, during presentations I have repeatedly been confronted with the remark that syntactically they do seem possible. Surely, the same pattern with another adverb, e.g. *did they often run out of fuel?*, is fine. This issue is futile, however. These expressions simply do not and cannot occur for deeper functional reasons, and that makes the question at the syntactic level superfluous. They are simply never constructed, so what would it mean to wonder whether they are syntactically possible or not?

(12) Is it probable that they have run out of fuel?

(13) a. *Probably they have run out of fuel?
b. *Did/Have they probably run out of fuel?

It has been noted, among others by Bellert (1977: 344) and Perkins (1983: 92), that some questions with modal adverbs, such as (14), do seem possible.

(14) Did/Have they perhaps run out of fuel?

However, as Greenbaum (1969: 111, 153) — on the basis of a corpus investigation — notes, these are marginal and subject to considerable restrictions. And, Perkins' skepticism notwithstanding, if they do occur they are not really expressions of epistemic modality, but rather speech act modifying elements, as was already suggested by Bellert (1977: 344), and is extensively discussed for the Dutch equivalent of *perhaps*, *misschien*, by van der Auwera (1983). (This speech act use is no doubt derived from the epistemic use though.) That is, rather than indicating a degree of likelihood of the state of affairs, the adverb modifies the 'tendency' of the speech act: it turns a neutral question into a tendentious one. By means of (14) the speaker indicates that (s)he has prior expectations regarding the interlocutor's knowledge about the state of affairs, and possibly even that (s)he suspects that the interlocutor has been withholding relevant information from him/her. Actually, in (14) it is not even the adverb but the state of affairs which is being questioned: the question is whether they have run out of fuel, not whether this is (somewhat) likely. Correspondingly, the adverb in (14) is necessarily unstressed, while a questioned constituent is usually stressed. So even formally this case does not affect the point of the observations in the literature regarding (12) and (13) (one should explicitly evaluate (13) in function of the use of the adverb to question the epistemic qualification).

In my Dutch corpus there is even a case with *waarschijnlijk* 'probably' in a question, despite the fact that this is generally considered completely impossible (the English translation does indeed seem unacceptable).

(15) u begrijpt ook niet dat wij klagen over het weer waarschijnlijk?
'you don't understand that we complain about the weather probably?'

This case is no doubt only possible because it involves a (more or less) rhetorical question which has declarative instead of interrogative syntax (the adverb *waarschijnlijk* in a truly interrogative clause is out of the question also in Dutch). Still, the adverb is again clearly used as a speech act modifier, rather than an expression of epistemic modality. It is even an essential element in making (15) a rhetorical question, and specifically in giving the expression the special reproaching effect which the declarative syntax alone would not achieve. Moreover, it is again clearly the state of affairs, not the modal adverb, which is being (rhetorically) questioned. So (15) is not a counterexample to the non-questionability of the adverbs either. On the contrary, cases such as (14) and (15) even enforce the assumption that we are dealing here with a fundamental difference between the adverbial and adjectival expression types, as it would seem impossible to use the predicative adjective construction in this kind of circumstances.

b. *Negative forms*

A second clear difference is that there are no negative modal sentence adverbs, while there are negative modal adjectives (Greenbaum 1969: 152; Bellert 1977: 343; Hengeveld 1988: 236–237). Thus, one can have (16), but not (17).

(16) It is improbable that they have run out of fuel

(17) a. *Improbably they have run out of fuel
b. *They have improbably run out of fuel

One can, of course, use *undoubtedly* as a sentence adverb in the context of (17). But this does not constitute a counterexample if the notion of a negative form is not interpreted structurally but semantically: although this adverb is morphologically negative, it does not express a negative polar modal qualification, but rather a strongly positive polar one (cf. Bellert 1977: 343).

As Perkins (1983: 92) observes, there are constructions such as (18).

(18) An impossibly irate Mr. Smith is on the line

But contrary to the cases in (17), (18) obviously does not involve a sentence adverb but a term-level adverb (*impossibly* only modifies *irate*). Moreover, this adverb does not have an epistemic meaning: it rather expresses the speaker's emotional or maybe even deontic attitude toward the property

ascribed to the head noun (*Mr. Smith*) by the adjective, hence it serves as an intensifier of the adjective. (Again, this meaning is probably derived from the epistemic meaning.) This explains why only (fairly) strong adverbs of this type can be used for this purpose: (18) is somewhat more difficult with *improbably* (although its Dutch and German counterpart does occur a few times in my data, each time with this same type of intensifying function relative to the adjective it modifies), and it is certainly unacceptable with *uncertainly* (the latter only exists as a manner adverb).

Apart from these two, many more differences between these expression types have been noted (including different behavior in conditionals, in interactions with tense, etc.). All of these will get proper attention in the following sections.

Observations such as these, then, have led many to believe that there must be a basic semantic difference between these expression types. And speculations regarding the nature of these differences have so far all tended in the same direction, viz. the introduction of two different types of epistemic modal elements at two different levels in the underlying representation of the utterance. Thus, Bellert (1977) has suggested that modal adverbs qualify the truth of the proposition expressed in the utterance in which they occur (which would explain why they cannot be questioned or negated). Hence they constitute a second, metalinguistic proposition. Modal adjectives, however, qualify the state of affairs referred to by the utterance, and are part of the (complex) proposition expressed by the utterance. Similarly, Lang (1979) argues that modal adjectives belong to the proposition and refer to an element of the world (the state of affairs), while modal adverbs are not part of the propositional meaning but express a speaker attitude toward the proposition (obviously, the speaker cannot question or negate his/her own current attitude).

These views are akin to the distinction between objective and subjective epistemic modality (cf. Section 1.4). In fact, Lyons (1977: 797ff) considers objective epistemic modality to be part of what he calls the ‘it-is-so’ or ‘tropic’ component of an utterance, while subjective epistemic modality is part of the ‘I-say-so’ or ‘neustic’ component of the utterance, which is superimposed on the ‘it-is-so’ component. It also happens to be the case that Lyons’ (1977: 799) list of distinctive properties of these modality types matches several of the behavioral features which have been observed to

characterize the difference between the adverbs and adjectives (including the ones in (a) and (b) above; many of these features are equally applicable to distinctions within the other epistemic expression types, as we will see in the next chapters). Lyons has not suggested a link between his modality types and the modal adverbs vs. adjectives issue. But the connection is made by Kiefer (1984) and especially by Hengeveld (1988): they claim that modal adverbs always express subjective modality and modal adjectives objective modality. (According to Hengeveld, the observation in (b) above would mean that subjective modality only involves a positive scale, while objective modality has a positive and a negative scale.) But there are other opinions on the sub/objectivity of the adverbs and adjectives, too: Perkins (1983), for example, assumes that both express objective modality, and Watts (1984) suggests that both express subjective modality. This goes to illustrate the problems discussed in Section 1.4 regarding how this distinction between subjective and objective modality has been analyzed in the past.

As will appear in the following sections, there are many valuable elements in these analyses of the differences between the adverbs and adjectives. But there is no reason to follow them in interpreting these differences in terms of two types of epistemic modality. As argued in Section 1.4, the subjectivity vs. objectivity issue can be interpreted much better in terms of a separate evidential category of (inter)subjectivity. And upon closer scrutiny the observed distinctive behavioral properties (those in (a) and (b) and others more) require a quite different type of explanation than suggested so far (see also Nuyts 1992a; the observation in (b) will not endanger our assumption — cf. Section 1.3 — that epistemic modality includes polarity either). The point is that these properties, and the differences between the expression types more generally, cannot be accounted for in terms of just a single underlying cause, but require recourse to several of the factors introduced in Section 1.4. In fact, the types of explanations discussed above seem to have been conflating several of these factors in one account: the situation of the epistemic qualification within the proposition vs. outside it is also strongly reminiscent of the distinction between descriptive and

performative qualifications (see Section 1.4). This matter should, however, be kept clearly apart from the (inter)subjectivity issue.[5]

In line with the remarks in Section 1.5, the corpus analyses below focus on one lexical item per expression type per language. Specifically, they focus on Dutch *waarschijnlijk* and German *wahrscheinlich* 'probably/probable' used as an adverb and as an adjective (as mentioned, neither use is morphologically marked, neither in Dutch nor in German), which can, in either category, be considered representative for the entire expression type. I do not use *mogelijk*, *möglich(erweise)* 'possible/possibly', both in order to avoid any (at this point in the investigation unwanted) complications which may arise from the ambiguity of this lexical item between an epistemic and a dynamic modal reading, and because a scanning of this form in the Dutch corpus indicates that occurrences with the latter meaning prevail.[6] The choice of *waarschijnlijk*, *wahrscheinlich* rather than *zeker*, *sicher* 'certain/certainly' is random. In line with the discussion in Section 1.3, other forms are not used because they can only occur as either an adverb or an adjective (see above for examples), hence the minimal pair-like situation, which is useful for our purpose, does not occur.

There is a 'but' to the use of matched rather than non-matched forms: it cannot be excluded that the double adjectival and adverbial use of a form has an effect on the properties of each of these uses, e.g. because of analogy effects. Such a risk obviously does not exist for non-matched forms. Even if there were such an effect, this obviously does not invalidate the value of the present investigation, but it would lead to a more diversified view of the

5. That performativity and sub/objectivity should get confused is not too surprising. Performative uses of modal expressions are in a way always subjective if taken in the sense of 'involving a personal commitment of the speaker'. Descriptive uses, on the other hand, are always objective if taken in the sense that they do not indicate the speaker's personal view, but originate outside his/her present circumstances. However, it is essential to see that (inter)subjectivity as defined here (as well as the classical sub/objectivity distinction for that matter) and commitment are two separate matters, as should be clear from the exposition of the two factors in Section 1.4. This is not to say that these two factors cannot occasionally interact, however: see, e.g., Section 2.3 below.

6. The cases I have encountered are overwhelmingly predicative adjectives. Of those less than 10% is epistemic or, most often, ambiguous between a dynamic and an epistemic reading. This is quite comparable to the Dutch modal auxiliary *kunnen* 'can/may', which will be analyzed in Chapter 4. The few adverbial cases seem in general clearly epistemic, however.

Table 2. *Frequency of* waarschijnlijk/wahrscheinlich

		Dutch				German			
		EXP	LIT	SPK	TOT	EXP	LIT	SPK	TOT
Adjective	n:	20	4	1	25	18	4	8	30
	0/0000:	0.37	0.24	0.05	0.27	0.32	0.21	0.35	0.31
	share:	16.5	10.0	1.8	11.5	23.4	19.0	8.8	15.9
Adverb	n:	101	36	55	192	59	17	83	159
	0/0000:	1.89	2.18	2.58	2.10	1.06	0.88	3.64	1.62
	share:	83.5	90.0	98.2	88.5	76.6	81.0	91.2	84.1

adverbs and adjectives. Hence, an investigation of non-matched forms (and of the other matched forms) should eventually be performed, too, in order to ascertain the representativity of *waarschijnlijk* and *wahrscheinlich*.

Table 2 shows the frequency of adjectival and adverbial *waarschijnlijk* and *wahrscheinlich* in the different segments of the Dutch and German corpora (on the abbreviations, see Section 1.6). These data are based on the entire Dutch and German corpora as described in Section 1.6 (see there for the word counts). The use of the full corpora is necessary because of the infrequency especially of the predicative adjective (and even then the number of adjectives remains inconveniently small).

The two languages differ considerably, especially in the higher frequency of both the adjective and the adverb in spoken German, and the lower frequency of the adverb in German expository and especially literary prose. I have no explanation for these observations: maybe they are just idiosyncrasies of the corpora and/or the languages. But both languages share a clear overall tendency (strongest in Dutch) for the adverb to be much more frequent than the adjective, irrespective of the discourse or text type. Even this purely quantitative observation already casts doubt on some of the assumptions found in the literature concerning the link between these expression types and the categories of subjective vs. objective epistemic modality. If the simple linkage of the adverb with subjectivity and the adjective with objectivity were adequate, then the data would imply that even in expository discourse — press and popular scientific works — authors are predominantly expressing subjective guesses rather than objective evaluations.

But would one not rather assume that press and science aim for objectivity, or would at least verbally suggest they do? Still, these data do not show that the dimension of (inter)subjectivity (in my terminology) is totally irrelevant for the choice between the expression types. After all, another tendency in both languages is for the adjective to have a relatively higher share in expository prose than in spoken language (or even in literature). It is not impossible that this is due to something like (inter)subjectivity. Nevertheless, the quantitative data clearly support the assumption that there must be more involved than just the latter factor.

In the following sections, then, I will discuss the behavior of the adverbs and adjectives in terms of the 4 factors introduced in Section 1.4. For each factor, I will first show what the corpus data reveal regarding its role in the use of the expressions. And then I will show how it contributes to understanding some of the behavioral properties of the expressions noted in the literature (thus also further supporting the factor's relevance).

2.2 Evidentiality

There is some truth in the claim put forward in the literature that there is a difference between the modal adverbs and adjectives in terms of their subjectivity vs. objectivity, or rather, their (inter)subjectivity in our new conception of the dimension.[7] But the status of the two expression types in these terms appears different from what has been assumed in the literature. Moreover, unlike the impression one might get from some of the earlier analyses, this factor is certainly not the most important one to account for the difference between the two expression types, as we will see in the next sections.

First of all, the suggestion that modal adverbs necessarily express a subjective evaluation (Kiefer 1984; Watts 1984; Hengeveld 1988) certainly does not hold water. To give just a few clear instances among the many available in the corpora: it is hard to interpret Dutch examples such as (19) and (20), or German example (21) — from popular scientific texts on

7. For the sake of simplicity, I will henceforth reframe the positions in the literature regarding the old sub/objectivity distinction in terms of the alternative analysis of (inter)subjectivity assumed here, thereby disregarding possible differences between the old analyses and the present one.

anthropology, biology and astrophysics, respectively — in terms of a purely subjective commitment on the part of the author.

(19) De oudste cultuurlagen in Japan tonen ons een jagers- en vissersvolk, zeer waarschijnlijk afstammelingen van immigranten van het vasteland van Azië.
‘The oldest cultural layers in Japan show us a people of hunters and fishermen, very probably descendants from immigrants from the Asian mainland.’

(20) [The genes] Zij bevatten de aanleg voor de ontwikkeling van de mens en deze aanleg is waarschijnlijk erfelijk en kan afkomstig zijn van of de man of van de vrouw.
‘They contain the disposition for the development of man and this disposition is probably hereditary and can be inherited either from the man or from the woman.’

(21) Alle Sterne in einem solchen Sternhaufen sind sehr wahrscheinlich etwa gleichzeitig aus einer gemeinsamen großen Gaswolke entstanden.
‘All stars in such a star cluster have very probably developed more or less simultaneously out of a common big gas cloud.’

There is no doubt that in each case the author does commit him/herself to these evaluations, i.e. these evaluations are performative (see Section 2.3 below). But this commitment is clearly shared with many other people, i.e. the epistemic evaluation is intersubjective.

This does not mean that modal adverbs then express objectivity (as is suggested by Perkins 1983) or intersubjectivity, however. The effect of intersubjectivity in (19)–(21) does not seem to be caused by the use of the modal adverb as such. It is rather a contextual effect, due to our general knowledge that there has been very substantial scientific research on space, genetic dispositions and the origins of Japanese culture, the results of which are generally available and in the case of astrophysics and genetics even widely known. Hence we simply know that expressions of probability in this connection are most likely not a matter of a subjective evaluation on the part of the author.

As a matter of fact, the corpus data (for both languages) reveal that in the large majority of expressions with the modal adverb there is no inherent

suggestion whatsoever as to whether the epistemic evaluation is subjective or intersubjective: it is simply neutral in these terms. In cases where there does seem to be an (inter)subjectivity effect, this can consistently be ascribed to purely contextual information, either derived from the discourse itself (from other linguistic elements in the utterance or in the preceding discourse), or based on our general knowledge of the world (as in the above cases). We may conclude, then, that adverbs do not inherently involve an (inter)subjective meaning component.

The situation is different for the expressions with modal adjectives, however: they do systematically involve an additional evidential meaning, and in several of the corpus cases this is clearly the (or at least one of the) actual motive(s) for using them. This evidential meaning is probably not due to the adjective as such, however, but rather to the syntax which it brings along. There are different possibilities in this connection.

First of all, the standard form of the expression with a predicative adjective, of the type *it is probable that*, suggests an intersubjectively based modal evaluation (in line with what has been assumed in the literature). And this is obviously due to the impersonal nature of this construction, as well as to the suggestion inherent in the use of the copula that the modal qualification is a property of the state of affairs proper. As Perkins (1983: 67) states, the auxiliary *be* "categorically asserts the modality expressed". It is not surprising, then, that one encounters this construction by far most frequently in circumstances which match this intersubjective nature. Thus, they often occur in reports on the results of objective scientific research, relatively much more frequently than in other contexts. One German example is (22), from a text on archeology (a Dutch example, from a text on biology, is (23) below).

(22) In der archaischen Zeit hatte die Mauer bereits denselben beträchtlichen Umfang wie in späterer Zeit. Es ist sehr wahrscheinlich, daß dieser älteste Mauerring, der für die damaligen Verhältnisse und Vorstellungen ungewöhnlich groß war, von dem Tyrannen Polykrates errichtet wurde, […].
'In the archaic era the wall already had the same considerable size as in later times. It is very probable that this oldest wall circle, which was exceptionally large for the circumstances and expectations in those days, was erected by the tyrant Polykrates.'

Similarly, one finds them in contexts involving explicit logical reasoning, as in (23) and (24). (This is often linked to scientific contexts, as in (23), but it can also involve more common sense reasoning, as in (24).) In these cases, the premises as well as the rational leading to the conclusion are available to everyone (in both examples they are even addressed directly), hence the conclusion is intersubjective. In (24), from an examination on German medieval literature, the interactive construction of the logical argument between examiner A and examinee B — who has made the unfortunate suggestion that the poet Wernher der Gartenaere could have been a farmer — actually takes several pages in the transcription (for the present purpose the conversation has been drastically shortened).

(23) Chauvin zette de proeven voort. Hij plaatste bijvoorbeeld een groene larve in een afgesloten fles tussen een hele partij zwart-rode soortgenoten. Prompt werd die larve ook zwartrood. Maar zag het minuscule ding dan de anderen en paste het vervolgens zijn kleur bij die van de anderen aan? Zeer onwaarschijnlijk!
‘Chauvin continued the experiments. For example, he put a green larvae in a closed jar between a whole set of black-red congeners. Instantly this larvae also turned black-red. But did the tiny thing see the others, then, and did it consequently adapt its color to that of the others? Highly improbable.’

(24) A: dichten heute die bauern? B: nee aber […] A: wo wird man wohl regeln die aus der antike kamen überliefern lernen? B: ja an sich im kloster […] A: meinen sie daß so n bauer zutritt da zu den klosterschulen hatte? B: nee das war ja nur für geistliche oder den hochadel bestimmt […] A: so daß im grunde für die bauern eigentlich wenig platz bleibt, es sei denn sie verlassen ihren hof und sind damit keine bauern mehr, ni:cht? also deswegen is es sehr unwahrscheinlich daß sich bauern an literaturproduktionen beteiligen.
‘A: do farmers make poetry these days? B: no but A: where could one learn to hand down rules from the antique era? B: in the monastery A: do you think a farmer would have gotten access to monastery schools? B: no that was only for clergymen or high nobility A: so essentially there remains little room for the farmers, unless they leave their farm and are thereby no

longer farmers, right? for that reason it is very improbable that farmers participate in literary production.'

But expressions with modal adjectives do not always indicate intersubjectivity (pace Perkins' 1983 and Hengeveld's 1988 assumptions): they clearly do not in different types of variations on the standard syntactic pattern. For example, if one compares the construction with double negation in (25) with its counterpart without negation (i.e. (11): *it is probable that they have run out of fuel*), the former clearly suggests a higher degree of subjectivity than the latter.[8] (26) is a Dutch corpus case (there are 3 such cases in the Dutch corpus, and 1 in the German corpus).

(25) It is not improbable that they have run out of fuel

(26) Mijn ontstemming werd nog groter toen mijn kameraden even later met een zelfvoldane gelaatsuitdrukking terugkeerden, al leek het mij niet onwaarschijnlijk dat zij maar branieachtig deden alsof zij een opwindend avontuur achter de rug hadden.
'My annoyance increased even more when shortly afterwards my friends returned with a self-satisfied facial expression, even though it seemed not improbable to me that they were only acting swanky as if they had an exciting adventure behind them.'

Subjectivity is also present in cases in which the speaker explicitly introduces the first person element in the utterance, as in German example (27) (there are also 2 Dutch corpus cases, including (26) above).

(27) Ich halte derzeit aber ein reales Wachstum von gut einem Prozent noch für wahrscheinlich.
'I presently consider a real growth of at least one percent still probable.'

For the adjectives expressing certainty, English, Dutch and German even have strongly idiomaticized constructions to express a subjective evaluation: *I am sure (of it) (that …), ik ben (er) zeker (van) (dat …), ich bin mir sicher (daß …)*. A quick sampling of my corpora indicates that in spoken Dutch this

8. The effect of types of negative marking in the main clause of propositional attitude expressions on the degree of (inter)subjectivity of the expression is discussed in Nuyts (1990a: 569–570, 1992b: 295–296).

subjective variant is more or less equally frequent as the standard impersonal (hence intersubjective) construction with this adjective.

The expression with modal adjectives also allows combination with yet other evidential categories. In several instances in the corpus there is an explicit characterization of the type of evidence — each time inferentiality — by means of a verbal evidential marker which replaces the copula (there are 5 Dutch and 1 German cases). Examples are (28), in which *lijkt* 'seems' indicates inferentiality, as well as (26) above, which is thus both inferential (due to *leek* 'seemed') and subjective (due to the double negation and reflexive *mij* 'me'). (The German case features *erscheinen* 'seem/appear'.)

(28) Het lijkt waarschijnlijk dat de scherpere opstelling der Nederlandse vakbonden in combinatie met de nieuwe arbeidersactie in Frankrijk en Italië de belangrijkste factoren hebben gevormd bij de standpuntwijziging […].
'It seems probable that the more rigid position of the Dutch trade unions in combination with the new labor actions in France and Italy have been the most important factors in the change of position.'

A final, nice illustration for the fact that expressions with modal adjectives are often correlated with the expression of an additional evidential element is also to be found in the — very similar — Dutch and German examples (29) and (30), which directly link the modal qualification to the existence of (presumably good, and elsewhere explicitly available) evidence for it (i.e. these are clearly intersubjective cases, not unlike (23) and (24) above, but (29) is from a non-scientific context).

(29) Er zijn andere argumenten aan te voeren, die het onwaarschijnlijk maken, dat Angela Davis te maken zou hebben met Jonathan Jackson's kamikaze-actie.
'One can adduce further arguments, which make it improbable that Angela Davis would be involved with Jonathan Jackson's kamikaze action.'

(30) Laborexperimente mit Plasmastrahlen machen es wahrscheinlich, daß durch die ständig auftreffenden Teilchen des Sonnenwindes und die kurzzeitigen Aufheizungen ein Zusammenkleben der Mondoberfläche hervorgerufen wird […].
‘Laboratory experiments with plasma beams make it probable that the continuous impact of particles of the solar wind and the short-term heatings cause a pasting together of the moon surface.’

In general, then, the expressions with modal adverbs do not, but those with modal adjectives do express (inter)subjective evidentiality as an additional qualificational category. Even for the adjectives, however, the evidential dimension does not appear inherent to the lexical item as such. Rather, it is brought along by the syntactic pattern in which the item figures, which is why one lexical form expresses subjectivity or intersubjectivity depending on the format of the construction. Of course, to the extent that one cannot avoid using the adjectives in the types of syntactic contexts mentioned, the evidential meaning is nevertheless unavoidably linked with the use of this form type.

So far for the observations based on the corpus data. What about the many behavioral features which differentiate between the adverbs and adjectives and which have hitherto been related to the subjectivity issue (see Section 2.1)? Hardly any of these can withstand critical scrutiny. Usually, associations between these features and the issue of subjectivity have been made on a purely intuitive basis, without thorough motivation. But a more careful attempt to spell out the potential causes for these features reveals that they are much more likely to be due to completely different types of factors (in the present expression types as well as in others for that matter; see also the next chapters). Hence, most of them will turn up in the discussions in the next sections.

There is only one observation in the literature which appears exclusively an effect of the (inter)subjectivity of expressions with modal adverbs and modal adjectives ((inter)subjectivity plays a partial role in one other behavioral feature: see the discussion of causality interpretations in Section 2.3). And this is actually a quite weak feature, to the extent that intuitions regarding it are very tentative and — judging from the questioning of some informants — subject to considerable variability. It has to do with the

listener's possibilities to object to the speaker's epistemic qualification of a state of affairs (cf. Lyons 1977: 799, and especially Hengeveld 1988: 237). Apparently, the listener cannot use the same type of formulation for this when the speaker has used a modal adjective or, alternatively, a modal adverb, as is shown in (31) and (32).

(31) A: It is probable that they have run out of fuel.
B: Who says so?

(32) A: Probably they have run out of fuel.
B: ?Who says so?
B′: Do you think so?

Although it is not entirely clear whether reaction B in (32) is totally out of place, B′ does seem more natural. If so, this indicates that it is difficult to avoid questioning the speaker if (s)he has used a modal adverb. In fact, if reaction B does occur in (32), it may tend to be understood ironically, meaning something like "you cannot be serious that that is your opinion". But one can perfectly well use reply B if the speaker has used a modal adjective, as in (31), without invoking this ironical connotation. For obvious reasons. A in (32) implies that the speaker is responsible for the opinion expressed, but since it involves no (inter)subjectivity, there is no indication that other people are coresponsible. Hence an interlocutor cannot avoid questioning the speaker personally when objecting to the latter's utterance. In (31), however, A does suggest intersubjectivity of the opinion, hence one can explicitly ask for its sources, i.e. the other people with whom the speaker shares this opinion and from whom (s)he may have borrowed it. One does not have to, of course: B′ in (32) could equally be used as a reaction to (31). The difference between B and B′ then seems a matter of politeness: response B is a hedge, in which the objector avoids questioning the speaker personally. If B is used in response to a more subjective expression with a modal adjective, such as (25): *it is not improbable that they have run out of fuel*, it would again seem to get the more ironical reading involved in its use in (32). This underscores that it is the (inter)subjectivity factor which matters here. (In further support of the reinterpretation of the issue of subjectivity in Section 1.4, note that the foregoing explanation is at least as elegant as the explanation in the literature in terms of the traditional conception of subjective vs. objective modality.)

2.3 Performativity

Another element differentiating the adverbs and adjectives (one not to be confused with the issue of subjectivity — cf. Section 2.1) is the matter of performativity vs. descriptivity. As mentioned in Section 1.4, performative uses are the default uses of epistemic expressions (there is no expression type which does not have them), and this is true also for the adverbs and adjectives. The differences reside in the possibilities for descriptive usage of these form types.

Modal adverbs cannot be used to express epistemic modal qualifications descriptively (see also Lang 1979: 213), at least not structurally. The only possible exception is when they are used in reported speech, direct, as in (33), or indirect, as in (34) (there are a few corpus cases of such reported uses).

(33) John said: they have probably run out of fuel

(34) The police say that John has probably run out of fuel

Strictly speaking, these uses are descriptive since they imply no speaker committment to the epistemic qualification. Yet, given that in reported speech the speaker is supposed to neutrally represent the position of another speaker, such uses are performative from the perspective of the quoted speaker. That is, in a way the present speaker re-performs the epistemic qualification for the other speaker. Moreover, in the somewhat less neutral indirect speech case in (34), one may even wonder whether the adverb does not imply that the present speaker is also committed to the evaluation. The few corpus cases are compatible with such an interpretation. Reported speech is known to be a very special (and highly interesting) type of environment (not only for this matter of performativity), but in order not to complicate the analysis too much, I will not go further into it here (or in the following chapters).

Modal adjectives, however, can very well be used descriptively, in a structural way, as is shown in (35) to (37).

(35) Hij acht het waarschijnlijk dat het blad wordt opgeheven of in een geheel andere vorm wordt voortgezet.
'He considers it probable that the journal will be discontinued or will be continued in a totally different form.'

(36) Es sei wahrscheinlicher, daß die Krankheit von Joachim Voss "durch Zigarettenrauchen ausgelöst worden ist".
'It would be more probable that Joachim Voss' illness "was triggered by smoking cigarettes".'

(37) It was probable that they had run out of fuel

In (35) and (36) the speaker describes someone else's evaluation of a state of affairs, in (37) (s)he describes a past evaluation. But there is no indication regarding the speaker's own point of view at the moment of speaking (at least not explicitly — see below). Descriptivity is certainly not a predominant cause for using the adjectives, however, since (35) is the only clear descriptive example in the Dutch corpus, and besides (36) there are only two other cases in the German data (there are no past cases like (37) in the corpora).

Note that (36) and (37) again carry the intersubjective meaning which also characterizes the present tense performative use of this construction (i.e. (11): *it is probable that they have run out of fuel*), as discussed in the previous section. There is a strong suggestion that the past evaluation in (37), or the other person's evaluation in (36), involves an intersubjective commitment on behalf of the past/other evaluator. This intersubjective element also seems to have an effect on how one normally interprets the present speaker's position regarding the epistemic evaluation: it strongly suggests that the speaker was part of the group of people who held this opinion in (37), or that (s)he is part of it in (36). This is not a necessary reading: these expressions can no doubt be used when the present speaker had/has another opinion, or did/does not know, or was/is indifferent. Nevertheless, in neutral contexts the (past or present) 'implicit agreement' reading is imminent. One can, thus, imagine that this kind of expression will be used when the speaker actually shares the evaluation, but does not consider this fact crucial for the ongoing discourse. Since (35) is parallel to the more subjective version of the adjective construction in (27) above (of the type: *I consider it probable that* …) it does not involve intersubjectivity in this case either. Rather, it indicates that the 3rd person subject has personal responsibility for the evaluation, and it seems completely neutral as to the position of the present speaker.

That adjectives do but adverbs do not allow descriptive uses is obviously due to the syntactic properties of either. A sentence adverb does not hold any direct or strict syntactic relation to the subject or even to the verb of the utterance. Hence if a speaker uses a non-first person subject and/or a past

tense form of the verb (as in (10): *probably they have run out of fuel*), this does not structurally affect the role/interpretation of the modal adverb. It can therefore only be taken to be speaker-oriented, i.e. to express the speaker's attitude here and now.[9] Predicative modal adjectives are necessarily (structurally) affected by their subject and the tense of their copula, however, and by modifying these elements the reading of the adjectives can be changed from speaker-oriented (performative) to non-speaker-oriented (descriptive).

The situation may sometimes be complex, though. Although past tense in a pattern with a modal adjective will normally indicate that the epistemic qualification is descriptive (viz. past), this is not always true in a simple or straightforward way, as is illustrated in (26) (repeated here from the previous section).

(26) Mijn ontstemming werd nog groter toen mijn kameraden even later met een zelfvoldane gelaatsuitdrukking terugkeerden, al leek het mij niet onwaarschijnlijk dat zij maar branieachtig deden alsof zij een opwindend avontuur achter de rug hadden.
'My annoyance increased even more when shortly afterwards my friends returned with a self-satisfied facial expression, even though it seemed not improbable to me that they were only acting swanky as if they had an exciting adventure behind them.'

In this example, from a literary text, the author reports on events as if they were happening at the very moment of his writing them down (i.e. 'erlebte Rede'). So in a way the modal adjective (and the evidential predicate for that matter) is used performatively. Still, the text is in past tense. The tense marking here does not express temporality, however, but indicates that the speaker is talking about a non-real possible world, i.e. it involves what may be called an 'irrealis past' (see, e.g., Fleischman 1989).[10] Of course, due to

9. This is not true for all adverbs: manner adverbs, e.g., as in *he painted the wall quickly*, are covered by the past tense of the predicate. This difference is due to the different semantic status of these adverbs. How one should understand this will become obvious in Chapter 6. The relevant point for the present discussion is, then, that the adverb's interpretation is not already determined by the syntax of the utterance (unlike for the adjectives), but is a purely semantic matter.

10. So this is not a case in which a performative epistemic qualification is within the scope of a temporal one, a situation which should not occur since (as will be discussed in Chapter 6)

the irreality of the situation, the adjective (and the evidential predicate) is nevertheless in a way also used descriptively (it describes a fictive, invented evaluation). This is of course a marked situation, probably only common in literary texts and in pretend play in young children.

The performativity status of the present tense variant of the standard pattern with the modal adjective, of the type *it is probable that* …, is actually not always absolutely evident either. All cases of this type in the corpora — including (22), (23), (24), (29) and (30) above — are clearly performative. Yet intuitively it would seem possible, in certain circumstances, to use this pattern in a (nearly) descriptive way (the discussion below of its behavioral features will offer illustrations). In fact, the borderline between the performative and a descriptive reading of this pattern seems fuzzy, and this is due to its intersubjective meaning (and, of course, like intersubjectivity itself, to its impersonal character; this observation does not apply to more subjective variants of the pattern such as double negative ones, though). Intersubjectivity implies that the speaker knows about other people's epistemic evaluations of the state of affairs. So, after all, an intersubjective performative expression somehow also involves a descriptive element: in a way it also describes the opinion of the others. Now one can easily imagine that the degree of commitment on the speaker's part in an intersubjective adjectival expression may vary, and may in certain circumstances even fade into near non-existence, in which case the expression essentially turns descriptive. This might occur when the speaker is not fully convinced, or when (s)he is not in a position to be fully committed e.g. because (s)he personally does not know or cannot judge the relevant facts, as is perfectly imaginable in a context of popular scientific reporting. Surely, even then using this pattern nevertheless seems to require that the speaker is not explicitly committed to an alternative view and is not opposing the epistemic evaluation expressed by the adjective. In other words, the speaker should at least feel the potential for being committed to the evaluation, and the pattern can probably not be used in radically descriptive cases. This kind of usage may of course also be employed as a conscious strategy by the speaker, if (s)he does not want to

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epistemic modality has wider scope — i.e. is higher in the hierarchy of qualifications — than temporality. The epistemic evaluation **is** within the scope of the irrealis expressed by the past tense form though: it is situated within the possible world evoked by the author.

commit him/herself to whether (s)he is really committed. Although it is probably hard to detect when that is really the case.

After these corpus-based considerations, let us return to the behavioral properties of the adverbs and adjectives noted in the literature. As argued in Section 2.1, the traditional type of account of these forms may (unconsciously) have been codetermined by the performativity factor (i.e. it has conflated this factor and the matter of (inter)subjectivity). In line with this, several of the distinctive behavioral features brought up in the traditional account (most of which have also been associated with the subjectivity issue) can actually be explained in terms of the performativity factor. This is true at least for the following ones.

a. *Questioning*

The (non-)availability of descriptive uses explains why modal adjectives can but modal adverbs cannot be used for questioning an epistemic qualification, as discussed in Section 2.1. Obviously, if a speaker is questioning an epistemic evaluation of a state of affairs, (s)he is not expressing his/her own evaluation, but is rather bringing a potential evaluation into the discussion. That is, the qualification is being described, rather than performed. Hence, only an expression with a modal adjective can be used for this purpose. (Another, probably complementary, explanation of this property relates to information structure. See Section 2.4 below.)

Note, however, that even this is not without limits: as shown in (38), questions with double negation on a modal adjective still seem very difficult.

(38) ??Is it not improbable that they have run out of fuel?

(38) seems acceptable only in a reading in which *not* is not taken to participate in the expression of the modal qualification as such, but is taken as a speech act modifying element which indicates that the speaker is expecting a positive answer. That is, (38) is possible in the reading: “is it not the case that it is improbable that they have run out of fuel?”. In the reading in which *not improbable* forms a functional unit which as a whole expresses a modal qualification, however, (38) seems impossible. (On these alternative roles of negation, see also Section 2.4 below.) But, clearly, the declarative variant of (38) (i.e. (25) in Section 2.2 above) is unavoidably interpreted as a (subjective) performative evaluation, whence the impossibility to use this construction to descriptively bring up a modal qualification in a question.

b. *Conditionals*
The same reasoning as for questions applies for the observation that modal adverbs cannot occur in the protasis of a conditional utterance, whereas modal adjectives can (Lyons 1977: 806; Perkins 1983: 68; Hengeveld 1988: 236). Compare (39) and (40).

(39) If it is probable that they have run out of fuel, I'll send a tanker after them

(40) *If they have probably run out of fuel, I'll send a tanker after them

In conditionals of this kind the speaker construes a hypothetical situation and indicates a course of action to be taken if the situation would turn out to apply. This means that the epistemic qualification in the protasis is not the speaker's actual point of view, but rather a possible point of view. Again, the qualification is being described rather than performed, hence only a modal adjective can be used. And, again, there is a limitation that the adjective cannot have double negation, as can be seen in (41).

(41) *If it is not improbable that they have run out of fuel, I'll send a tanker after them

Obviously, modal adverbs can be used in the apodosis of a conditional (Bellert 1977: 344), as in (42),

(42) If they have run out of fuel, I'll probably send a tanker after them

but then they do express the speaker's present evaluation (performatively) of the chances that a certain course of action will be taken if the state of affairs in the protasis would turn out to apply. It actually seems somewhat more difficult to use a predicative adjective instead of the adverb in the apodosis in (42). This has probably little to do with the performativity issue, however, but more with information structure. In a conditional such as (42) the protasis tends to be focal (often contrastively). But, as we will see in Section 2.4, a predicative adjective tends to be used when the epistemic qualification is focal. Hence using an adjective in the apodosis of (42) potentially leads to a 'focality-conflict' between protasis and apodosis.

c. *Causality*

Also consider Lang's (1979: 210) observation concerning the differences in meaning of (43) and (44).[11]

(43) Peter trinkt noch einen Schnaps, weil es wahrscheinlich ist, daß er süchtig ist
'Peter drinks another schnaps, because it is probable that he is addicted'

(44) Peter trinkt noch einen Schnaps, weil er wahrscheinlich süchtig ist
'Peter drinks another schnaps, because he is probably addicted'

In (43) the default reading would be that Peter's awareness of the fact that he is likely to be addicted (which he may just have learned from his physician, for example) causes him to drink another schnaps, while (44) cannot get this reading. This would seem a combined effect of performativity and (inter)subjectivity. Since an adverb is unavoidably performative, in (44) it necessarily implies that the speaker is giving his/her own present evaluation about the likelihood that Peter is addicted. Therefore, the causal clause as a whole is automatically interpreted as a personal cause ascription by the speaker. Given the ambivalent status of the intersubjective adjectival pattern in terms of performativity, the situation is completely different in (43), however. Since the utterance is about (actions performed by) Peter anyway, the adjectival pattern can easily be understood as describing Peter's own concern that he may be addicted (probably shared by others, e.g. his physician). Consequently, the causal clause can easily be taken to express Peter's own motivation for drinking another schnaps. The utterance actually leaves it open whether the speaker also shares this evaluation, or is rather neutral concerning it.

11. These examples from Lang have been slightly adjusted for the present purpose: Lang uses the emotional attitude adjective *bedauerlich* 'unfortunate' and adverb *bedauerlicherweise/leider* 'unfortunately', for which the same argumentation applies. This, again, goes to show that the element of performativity is not only relevant for an analysis of epistemic modality.

2.4 Information structure

By far the most important factor differentiating between the use of the modal adverbs and adjectives is information structure. This is not surprising if one looks at the syntactic patterns in which they occur. If one compares (10): *probably they have run out of fuel* and (11): *it is probable that they have run out of fuel*, the latter appears quite similar to a cleft variant of the former. In line with the informational structure of clefts, then, this suggests that the adjective can be used if the epistemic qualification acquires strong focality in the discourse context.

This assumption is clearly supported if one takes a closer look at the occurrences of the modal adjective in the corpus: in the overwhelming majority of them the epistemic qualification can indeed be considered very central information in the utterance.[12] In 20 out of the 25 occurrences in the Dutch corpus (i.e. 80%), and 25 out of the 30 cases in the German corpus (83.3%), this diagnosis is also formally supported by the fact that they inhere certain features which, in quite different ways, can be related to focality of information (cases can have one or more of these features).

a. *Combination with negation*

As mentioned in Section 1.3, the present analysis starts from the assumption that epistemic modality is intertwined with the qualificational dimension of polarity. Still, very often the polar component of the epistemic scale finds expression separately from the scalar component (i.e. the indication of the grade of the qualification on the epistemic scale as such). This is by far most frequently the case when the qualification involves negative polarity, which is then (usually) coded in the negative particle *not*, *niet*, *nicht*. This negative marker thus complements the epistemic modal expression as such, which, strictly speaking, then only codes the scalar component of the qualification. (Sometimes even positive polarity can get a separate marking though, as we will see in this and the next chapters.) The reason why in actual expression these two components should often get separated (even though they constitute

12. The findings in Tiggeler (1991) suggest that this is again a property, not only of the epistemic adjectives, but of the category of evaluative predicative adjectives in general.

a semantic unit), then, is to be found in their informational status.[13] The full details of how this works will gradually become apparent in the remainder of this section and in the sections on information structure in the following chapters. One crucial dimension of it, however, is the fact that by its very nature negative polarity is inherently contrastive in (nearly all) discourse contexts, and contrastiveness is a major cause for making an element linguistically salient (see Chafe 1994). Contrastiveness is not an intrinsic feature of the scalar component of the epistemic qualification, however (which does not mean it cannot acquire contrastiveness, of course — see below), so at least in this regards there is no inherent reason for the expression of this scalar component, or of a positive polar epistemic qualification as a whole, to acquire special salience.

Against this background it is interesting to observe that the modal adjective very often participates in the expression of a negative polar epistemic qualification: there are 8 German and even 12 Dutch corpus cases (i.e. respectively 26.7% and 48% of the modal adjectives). In all of them (Dutch and German) this involves main clause negation, i.e. there are no cases with negation in the embedded clause. And the large majority even involves negative incorporation (*onwaarschijnlijk*, *unwahrscheinlich*): 9 in Dutch, 7 in German. In all these cases, the intimate combination of the expressions of the polar and the scalar components of the epistemic evaluation as such suggests that both components together are focal in the discourse context.

Thus, consider why there would be no cases with negation in the embedded clause, even though they are perfectly feasible: *it is probable that they have not run out of fuel* (as the pendant of (16): *it is improbable/not probable that they have run out of fuel*) sounds fine.[14] This may be a

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13. Some functionalists will consider the assumption that one semantic unit should often get expressed in two lexical forms unacceptable, due to their rejection of abstractness in linguistic analysis (see Section 1.2). Surely, so they argue, if there are often two forms at the surface, this must be because there are two underlying forms as well. Yet the present explanation for the frequent occurrence of two surface forms for one underlying unit is thoroughly functional, but it also grasps a basic intuition about the conceptual nature of the phenomenon. This goes to illustrate the point made in Section 1.2 that cognitive functionalism is perfectly compatible with, and even requires some kinds of abstractness in one's analyses.

14. There is one case in the German spoken data which might possibly involve embedded clause negation. Yet its interpretation is highly uncertain because the expression is grammatical-

coincidence, but it may also be meaningful in terms of the usual informational status of the adjective. One may speculate that embedded clause negation would be chosen if the informational status of the polar and scalar dimension are different (see Nuyts 1990a, 1992b). Thus, one marginal possibility is that the scalar component of the qualification, expressed in the adjective, is more salient than the negative polar component. One can only imagine this in highly marked contexts, for instance if one wants to correct the scalar dimension of a qualification suggested in the foregoing discourse separately from its polar dimension: *it is not certain, it is probable that they have not run out of fuel*. It is not surprising that such cases should not occur in the data. Another, more likely possibility would be that the polar component is more salient than the scalar one. The absence of such cases in the adjectival data suggests, then, that speakers would use other epistemic expressions to achieve this (e.g. an adverb — see (e) below), and that they select the adjective only when the scalar dimension is focal together with the polar one.

The fact that several of these negative adjective cases have one or more of properties (b)-(d) below further supports this analysis. Examples in which the polar and scalar components of the qualification are clearly focal together are (46), (49) and (50) below.

Apart from the above cases, there are also 1 German and 3 Dutch cases with double negation in the corpus, including (45).

(45) Bomans: “U krijgt nu een hogere functie bij de NATO?” Luns: “Het is niet onwaarschijnlijk, inderdaad, dat ik daarvan secretaris-generaal zal worden.”
‘Bomans: “You will get a higher position in NATO now?” Luns: “It is not improbable, indeed, that I will become secretary-general of it.” ’

Obviously, such an expression does not involve negative polarity as a conceptual category: the evaluation expressed is positive.[15] The role of the

ly infelicitous and while producing it the speaker constantly hesitates, restarts and repairs, thereby conflating different syntactic patterns. Therefore the case has been excluded from the analysis.

15. This is true for the default reading of this expression type, in which *not improbable* is one functional unit. There is also another reading in which *not* negates *improbable* (see (l) below). Such a reading only seems possible in echo utterances, to deny an explicit statement regarding

double negative marking is to provide for a richer and more subtle rendering of the modal qualification than is possible by means of a simple positive formulation (see Nuyts 1990a on the meaning of double negation in the context of the phenomenon of negative raising). The fact alone that the speaker is trying to be so nuanced in formulating the qualification is an indication that — also in these cases — it is salient in the discourse.

b. *Reduced forms*

In 7 Dutch (28%) and 8 German (26.7%) cases the adjective is used in a ‘reduced’ construction of the type *that is probable*, i.e. without a complement clause representing the qualified state of affairs, but instead with, in the subject position, the deictic pronoun *dat*, *das* ‘that’ or another comparable deictic element (e.g. the relative pronoun *wat*, *was* ‘which’), which refers to a state of affairs external to the utterance. This pattern mostly occurs as an addition to an utterance which has been uttered just before, usually one in which some epistemic evaluation, not shared by the speaker, is raised (implicitly or explicitly). For example, it occurs when the previous utterance was a (tendentious) *yes/no*-question, as in (46), or when the speaker reacts to a statement by the interlocutor, as in (47) (the latter is from a discussion regarding the altitude at which aircraft for geographical research fly in Germany and Switzerland).

(46) Höfer: “Komt het dan voor het verdrag met Polen tot een regeling over Berlijn?” Breitenstein: “Dat is niet waarschijnlijk.”
‘H.: “Will there be a deal about Berlin before the treaty with Poland?” B.: “That is not probable.” ’

(47) A: und die fliegen vielleicht in anderen höhen, ich weiß es nicht. B: ja das ist wahrscheinlich.
‘A: maybe they fly at different altitudes, I don’t know. B: yes that is probable.’

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the improbability of the state of affairs in the foregoing utterance. The assumption that the default reading of this expression type does not involve negation of a negative modal qualification, however, is also supported by the fact that it does not carry the presupposition that the opposite could have been true (utterances with ‘normal’ negation always do carry this presupposition). Thus, in example (45) there is no presupposition that it could have been ‘improbable that I (i.e. Luns) will become secretary-general of it (i.e. NATO)’.

In these and other similar cases the epistemic qualification (as a whole, i.e. both the scalar and the negative polar component when present, as in (46)) is the single important piece of information which the interlocutor adds to the discourse by means of the utterance.

c. *Forms with complex subject-NP*
Also in a way reduced are cases in which the state of affairs qualified by the adjective is not contained in a complement clause, but in a noun phrase (often a quite complex one, e.g. involving a relative clause) which takes the subject position of the predicative adjective. This thus involves a (sometimes high) degree of nominalization of the event in the qualified state of affairs. In the Dutch corpus there are only 2 such cases (8%), including (50) below, but in the German corpus there are 8 of them (26.7%), including (48). (In the Dutch corpus there is one more case which can be considered a precursor to this type of construction, viz. one in which the complement clause has been preposed and thus figures as a subject clause to the predicative adjective, of the type: *that [SoA] is probable*.)

(48) Inwieweit direkte Beziehungen zwischen Störungen des äußeren Strahlungsgürtels und dem Auftreffen von Polarlichtern bestehen, ist noch in der Diskussion. Zumindest für die relativ seltenen starken Polarlichter in Breiten unterhalb 55 Grad erscheint derartige Verknüpfung wahrscheinlich.
'To what extent there are direct relations between interruptions in the exterior radiation belt and the occurrence of polar lights is still disputed. At least for the relatively rare strong polar lights in latitudes below 55 degrees such a correlation appears probable.'

The fact that the qualified state of affairs is relegated to an NP and the adjective figures as the main predicate of a simple clause is a clear sign of the higher informational importance of the latter as compared to the former. In fact, in many of these cases the state of affairs has been introduced before in the context and is only repeated in summarized form, or is directly derivable from information provided before, or is generally known and thus does not have a high news value.

d. *Contrast*
In 7 Dutch (28%) and 10 German cases (33.3%) the adjective is used when the epistemic qualification (again as a whole, i.e. the scalar and the negative

polar component when present) is in a structurally contrastive position. Thus, the epistemic qualification can be in explicit contrast with an alternative qualification of the same type, as in (49) and (50).

(49) […] d.w.z. is het onwaarschijnlijk of logisch zelfs uitgesloten te veronderstellen dat y de variabele x of z veroorzaakt heeft of hieraan voorafgaat […].
'i.e. it is improbable or logically even excluded to assume that y has caused the variable x or z or precedes it.'

(50) Publicatie daarvan is altijd mogelijk, alhoewel niet zo waarschijnlijk.
'Publication of it is always possible, although not so probable.'

Another structural form of contrast is when the adjective is used in the comparative or superlative mode, as in (51) (all 10 German cases of explicit contrast are of this type, for Dutch there is only 1 case).

(51) Die Medien sind also demnach inzwischen imstande, selektives Kommunikationsverhalten des Publikums zu durchbrechen. Je mehr sie dies aber können, desto wahrscheinlicher ist es, daß die von ihnen präsentierten Informationen auch Wirkungen auf das Publikum haben.
'The media are thus meanwhile able to break through selective communicative behavior of the public. The more they are able to do this, however, the more probable it is that the information presented by them has an effect on the public.'

As mentioned before, contrastiveness is an important factor for making an element — in this case the epistemic qualification — focal in discourse.

The role of contrastiveness is actually not limited to the cases of explicit or structural contrast just mentioned. Upon closer scrutiny, practically all other cases in (a), (b) and (c) above involve contrast as well (as was already suggested regarding the reduced forms in (b); and for the cases with negation this is no surprise either since the adjective joins the inherently contrastive negative polar expression). But the contrast is then not sentence-internal, but with elements in the foregoing discourse. The contexts provided in examples (45)–(48) are sufficient to illustrate this: each time the modal adjective somehow reacts to epistemic issues raised by foregoing utterances —

(tendentious) questions, expressions of uncertainty or ignorance, or assumptions not shared by the present speaker.

Turning to the modal adverbs now, these forms appear to occur consistently in discourse conditions in which the epistemic qualification (or at least the scalar component of it, which is expressed in the adverb) is not focal, i.e. when some other qualification expressed in the utterance, or (parts of) the information about the state of affairs itself, or the polar component of the epistemic qualification alone, is (are) the most important information in the discourse. This observation is in line with Lang's (1979) claim, for German, that modal adverbs (next to some other sentence adverbs) cannot even be brought into focus at all (which translates, among other things, in an inability to receive main sentence stress). The same appears true for Dutch and English.

At first sight, this assumption may seem questionable on the basis of the observation that one can perfectly highlight a modal adverb by means of prosodic features: in an expression such as (3): *probably they have run out of fuel* one can easily imagine the adverb receiving special intonation, rhythmic features, etc. However, it will be equally clear that it is hard to do so without also stressing some other part of the utterance, preferentially the last word, and this latter stress is clearly a better candidate for the label 'sentence stress' than the special prosody on the adverb. In fact, it has been observed before, specifically with respect to German, that accent on evaluative adverbials is a special thing. According to Lötscher (1985: 244), the presence of a modal sentence adverb does not seem to have any effect on the stress pattern of the rest of the utterance, whatever the degree of stressing of the adverb. Even if the adverb receives stress, it seems there still has to be a main sentence stress elsewhere in the utterance, too. The prosodic information in my spoken corpora is insufficient to check this in a reliable way, but at least it does not provide counterindications. Lötscher (1985: 241) also observes that the special prosody on epistemic (and some other types of) adverbials "zeichnet sich […] durch eine gewisse Unbestimmtheit der Akzentuierungsstärke, zugleich aber durch gewisse zusätzliche Eigenheiten aus". In fact, its physical properties seem quite different from those of a normal focal sentence stress. It is of course difficult and tenuous to determine this without a detailed phonetic analysis, but intuitively, the special prosody on the adverb seems, among other things, to involve a more considerable lengthening of the word than a normal sentence stress. Another

type of physical difference is that the stress on the adverb would seem to involve much more additional facial expression than a normal focal stress.

From a functional perspective, if one tries to imagine what one does when highlighting the adverb in an utterance such as (3): *probably they have run out of fuel*, it will be apparent that this is quite different from stressing in order to mark the main focus of an utterance. What the special prosody on the adverb appears to do is further modify — and more specifically strengthen — the precise epistemic value expressed by the adverb. That is, this special prosody appears to contribute to the expression of the epistemic qualification, rather than to the expression of its informational status (salience) in the utterance.

The following observations offer considerable empirical support for the non-focal status of the modal adverbs in the corpus.

e. *Separated expression of polarity*

There are 22 Dutch and 19 German cases in which the adverb participates in the expression of a negative polar epistemic qualification. In absolute terms this is more than the number of such cases with the adjectives. Yet in relative terms this constitutes only 11.5% and 11.9% (respectively) of all adverbs, i.e. much less than the 48% and 26.7% of (single) negation cases with the adjectives. And also the nature of the cases is quite different.

Thus, unlike what we have observed for the adjectives, in the adverbial cases the negative component is informationally clearly more salient in the discourse than the scalar component of the qualification. In most cases this is due to the fact that the negative polar factor as such, independently of the scalar component, contrasts with a (usually epistemically unqualified) positive view concerning the state of affairs (i.e. in line with the observation in (a) above regarding the inherent contrastiveness of negation). The negative expression then either reacts to a positive view expressed in the preceding context or assumed to be the default expectation of the listener/reader, and/or it anticipates a positive statement with respect to the state of affairs in the following context. The scalar component of the qualification then only has a secondary role to play. In (52), for example, the author reacts to the readers' (presumed) assumption that the soccer game will be played in the Boca Juniors Stadium in Buenos Aires, and (s)he moreover anticipates a discussion in the following context (after a short explanation of the reasons for not playing the game in this stadium, which is omitted here) of where the

game may be played instead. Similarly, in (53) the speaker negates the positive assumption he has (by way of argument) built up himself first.

(52) De voetbalwedstrijd Estudiantes de la Plata — Feyenoord zal woensdag a.s. waarschijnlijk niet in het Boca Juniors Stadion in Buenos Aires worden gespeeld. [...] Het bestuur van Estudiantes hoopt uit te kunnen wijken naar het Giant River Plate Stadion in de Argentijnse hoofdstad [...].
'The soccer game Estudiantes de la Plata — Feyenoord will next Wednesday probably not be played in the Boca Juniors Stadium in Buenos Aires. The management of Estudiantes hopes to be able to move to the Giant River Plate Stadium in the Argentinean capital.'

(53) [...] ziemlich gefährliche sache. weil man da eigentlich den bürger zur selbstjustiz gewissermaßen aufruft. und bei den bürgern so das gefühl vermittelt daß sie eigentlich schon das wahre rechtsbewußtsein hätten und im grunde genommen sehr wohl in der lage wären selbst die justiz zu vertreten oder selbst sich so zu verhalten daß es im grunde genommen mit den rechtsnormen übereinstimmt. in wirklichkeit ist das wahrscheinlich nicht der fall.
'rather dangerous thing. because one thereby to some extent invites the citizen to selfjustice. and transmits among the citizens the feeling that they really would already have the true sense of justice and would basically very well be able to represent justice themselves or to behave themselves in such a way that it basically conforms to the norms of justice. in reality this is probably not the case.'

In line with this is the observation that in 12 cases in the Dutch and German corpus each, the negative element has a (mostly aspectual or temporal) dimension directly associated with it, which underscores its contrastiveness and, hence, adds to its salience. In (54), for example, the fact that the state of affairs will (probably) never become true is the most important aspect of the message. In this case the contrastiveness is very explicit through the opposition between 'not only now *niet* 'not'', but 'also in the future *nooit* 'never' ' (there are yet 3 other similar cases with explicit

contrast of this kind in the Dutch corpus). In (55) *noch nichts* 'nothing yet' stands in contrast with the present situation in which the state of affairs does apply. Similarly, in (56) *niet meer* 'not anymore' stands in contrast with what used to be the case.[16]

(54) Scheppend denken kan de machine niet en zal ze waarschijnlijk nooit kunnen.
'Machines cannot think creatively and will probably never be able to do so.'

(55) Wahrscheinlich haben Erscheinungen am Himmel unseren Urahnen noch nichts bedeutet.
'Probably, appearances in the sky did not mean anything to our ancestors.'

(56) Hij schrijft, dat het testament van de grote Willem waarschijnlijk niet meer betwist zal worden.
'He writes that the will of the great Willem will probably no longer be contested.'

Interestingly, in the Dutch corpus there are also a few comparable constructions with modal adverbs in which positive polarity, which normally remains unmarked, is explicitly marked by means of the particle *wel*, which then usually also receives heavy stress (there is no equivalent for this word in English). This includes (57) (another example is (58) below). There are no comparable cases in the German corpus, though.

(57) […] en dit keer wordt ie niet bijgestaan door grootmoeder Mamadora, maar waarschijnlijk wel door haar kleinkinderen: Bart Kaell en Two in Love!
'and this time he is not accompanied by grandma Mamadora, but probably he is by her grandchildren: Bart Kaell and Two in Love!'

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16. One might get the impression that in some of these examples — especially in (54) — the modal adverb has the negative expression in its scope. This would go against our assumption that normally polarity and epistemic modality are two dimensions of one complex qualification, coextensive in scope. But this impression is probably only partly correct. An expression such as *nooit* 'never' is a surface-linguistic contraction of *niet ooit* 'not ever', in which the negative element has scope over the temporal one. Hence semantically the modal adverb probably only has scope over the temporal component of the expression, not over the negative component.

In these cases, again, the positive polar component as such is salient for reasons of contrast (like in the cases with negative polarity above), while the scalar component of the qualification is secondary in this respect (as it is not part of the contrast). Hence the need to mention the polar component separately from the scalar dimension expressed by the modal adverb, even though the modal adverb as such already implies positive polarity, of course.

f. *'Absolutive' uses of the adverb*

There are a few corpus cases in which a modal adverb is used in an 'absolutive' way, which seems quite comparable to the reduced form of the adjective constructions (cf. b above): like the latter, it occurs as an addition to a foregoing utterance. There are 3 Dutch (1.6%) and 4 German (2.5%) cases, i.e. absolutely and relatively much less than the number of reduced forms of the adjective. Of course, one might wonder whether our interpretation of reduced forms of the adjective in terms of focality cannot equally be applied to the absolutive adverbial cases. This would obviously falsify any assumptions regarding the necessarily non-focal status of the adverb. The answer is negative. This is quite apparent for the 4 cases (2 German, 2 Dutch) involving a separate expression of polarity, for which the argument developed in (e) above applies. This includes (58) (with a separate positive polar expression) and (59).

(58) Het blijft altijd een interessante speculatie of het Linotype-systeem zich zou hebben gehandhaafd indien de moedermaatschappij haar belangen minder fel zou hebben verdedigd. Waarschijnlijk wel, want anders was deze machine niet ruim zeventig jaar principieel onveranderd in gebruik gebleven; […]. 'It always remains an interesting speculation whether the Linotype system would have maintained its position if the parent company had less fiercely defended its interests. Probably it would, because otherwise this machine would not have remained in use, essentially without modifications, for more than seventy years;'

(59) A: nun sagt sie [the mother] was macht der [the son] mit diesem mädchen das nur dasitzt und bla macht. B: nun weiß man natürlich nicht ob das mädchen bla macht wenn es mit dem jungen mann alleine ist wenn die schwiegermutter nicht dabei ist. A:

> wahrscheinlich nicht. B: ich könnte mir nämlich vorstellen daß man bei solcher frau einfach eingeschüchtert ist […].
> ‘A: now she says what is he doing with this girl who only sits there and says nothing substantive. B: now one obviously does not know whether the girl says nothing serious when she is alone with the young man when the mother-in-law is not there. A: probably not. B: for I could imagine that one is simply intimidated by such a woman.’

What makes these cases different from reduced adjective cases such as (46) and (47) above? The difference is that in the adjectival cases the probability element has been explicitly brought up as an (open) issue in the foregoing discourse. In (46), e.g., the text is about the chances that certain decisions will be made to improve the relations between Poland and Germany. In (47) the question has been how likely it is that Swiss and German aircraft fly at the same or different altitudes, so that Swiss and German pictures for geographical research available to the interlocutors can be reasonably compared. In the present cases, however, probability is not a central issue. In (59) what matters in the first place is the opposition between the (certain) presence of a feature in one condition (when the mother-in-law is there) and its presence or absence in another condition (when she is not there). In (58) what matters is the positive fact which is supported by the argument in the *because*-clause, not its probability. Of course, in specific cases it may be a matter of personal appreciation by a speaker — hence it may seem arbitrary — whether only the polar component, or rather the polar and scalar component together are considered important. But that is obviously not an argument against the present analysis of the differences between absolutive uses of the adverb vs. reduced forms of the adjective.

The 3 remaining instances of an absolutive use of the adverb in the corpus, which do not involve a separate positive or negative polar expression, might seem more difficult at first sight. But upon closer scrutiny they are not counterexamples either. Consider (60), from an interview in which A asks B (named Bob) and C a question about a colleague of theirs (named Toni), and (61), from a conversation between geographers regarding work plans (the adverb which interests us is the one in B’s second reply). (The third case is fully comparable to these two.)

(60) A: trouwens, zei hij, indertijd dan wilde ik dat ook niet, ik wou niet graag populair zijn. is dat waar, Bob? B: ik geloof het niet. Toni was even graag populair als wij het waren, hé?! [addressing C for confirmation] C: ja. waarschijnlijk.
'A: actually, he said, in those days I didn't want that either, I didn't want to be popular. is that true, Bob? B: I don't believe so. Toni liked to be popular as much as we did, right?! C: yes. probably.'

(61) A: ich will sehen daß ich die morphologie mache. und der herr luft fährt wahrscheinlich so mit. der möchte oder sollte, s wird noch mündlich besprochen, die wasserkraftnutzung, also schluchseewerk und sowas dann. B: schluchsee und holzenwald ja. A: holzenwald werk wahrscheinlich. B: wahrscheinlich.
'A: I want to try to do the morphology. and mister luft probably just comes along. he wanted or should, that is still to be discussed orally, [do] the exploitation of water power, so schluchsee station and something like that then. B: schluchsee and holzenwald yes. A: holzenwald station probably. B: probably.'

It is formally undecidable whether the epistemic expression in C's and B's reply respectively is an adverb or rather a predicative adjective used in an elliptical variant of the reduced construction. Yet, since the English equivalent leaves little doubt that it is an adverb, one may assume the same for Dutch and German. Now these cases are quite different from the uses of the reduced adjectival pattern. In these cases the modal adverb does not mark information central to the discourse. Rather, in (60) it supports and only slightly modifies B's claim, which is and remains the central statement. And in (61) B even simply repeats A's epistemic statement, thus supporting the latter's assumption. Hence, the use of the adverb in these cases is functionally totally different from the use of the adjective in the cases in (b) above, and is fully conforming to its presumed non-focal status.

g. *Qualification only of (backgrounded) subparts of the utterance*
The non-focal nature of the modal adverbs is further evinced by the fact that a considerable number of them in the corpus do not actually relate to the entire utterance, but only to a subpart of it. There are two types of this.

– First, adverbs fairly often occur, hence only affect the information in types of embedded clauses — most frequently relative clauses, some-

times adverbial clauses — which have traditionally been considered means to provide background information (Givón 1984; Tomlin 1985).[17] That is, such clauses typically provide non-salient, non-focal information which is only meant to support (refine, clarify, etc.) the central or foreground information in the main clause.[18] There are 16 such cases (i.e. 8.3% of all modal adverbs) in the Dutch corpus, and 13 (i.e. 8.2%) in the German corpus. (62) and (63) are illustrations.

(62) en de president die er zal komen, die waarschijnlijk één dezer dagen zal benoemd worden, zal duidelijk iemand zijn die met het leger het nieuwe Haïti […] zal opbouwen.
'and the future president, who will probably be nominated one of these days, will clearly be someone who with the army will build the new Haiti.'

(63) Durch ständige Vermehrung zerstören die Parasiten ihre Wirtszelle und befallen wieder andere, gesunde Zellen. Wahrscheinlich auf dem Blutwege hingeführt, wandern sie unter bestimmten Bedingungen über die Embryonalhüllen in das werdende Kind.
'Through continuous reproduction the parasites destroy their host cell and attack yet other, healthy cells. Probably brought there via the bloodstream, they migrate under certain conditions via the embryonic covers into the child in development.'

– Second, especially in the Dutch data adverbs in the main clause are quite often used not to qualify the main body of the clause (the core of the state of affairs expressed in it) but only a non-central subpart, often a constituent which has characteristics of a parenthetical structure. These adverbs thus only affect some side-aspect of the state of affairs, i.e., again, secondary, backgrounded information rather than central, fore-

17. I have not included complement clauses in this, because they normally do not belong to the category of embedded clauses which can be said to provide background information. Cf., e.g., the complements of communication predicates such as *he writes that* … in (56) above, or of mental state predicates such as *I think that* …, to be discussed in the next chapter.

18. 'Background vs. foreground' is thus not to be confused with 'old vs. new' (or 'presupposed vs. asserted'): in principle, background information is/can be newly asserted information in a clause (cf. Givón 1984).

grounded information.[19] In the German data there are only 10 such cases (6.3% of the adverbs), but in the Dutch corpora there are 32 of them, i.e. 16.7% of all occurrences. Illustrations are (64) and (65).

(64) Buiten het ene rubberbootje dat ik met het blote oog al had bespeurd, ontwaarde ik er nog twee, waarschijnlijk motorbootjes, die stillagen en van waaruit gevist werd.
‘Apart from the one rubber-boat which I had already detected with the naked eye, I discerned two more, probably motor-boats, which lay idle and from which they were fishing.’

(65) Wie die Cholera 1830, hat die Pest von 1348 Stadthygiene und epidemiologische Forschung in Antrieb gesetzt […]. Nicht zuletzt durch neu hinzukommende Krankheiten wie den ‘englischen Schweiß’ (wahrscheinlich eine Viruserkrankung) und die ‘Geschlechtspest’ des ausgehenden 15. und des 16. Jh. (Syphilis) wurden die alten Autoritäten erschüttert.
‘Like cholera in 1830, the plague in 1348 instigated urban hygiene and epidemiological research. Not least through new additional diseases such as the ‘English sweat’ (probably a viral disease) and the ‘genital plague’ of the late 15th and the 16th century (syphilis), the ancient authorities were shaken.’

In total, then, 14.5% of the German and even 25% of the Dutch modal adverbs only affect what may be considered background domains in the utterance, which contain non-salient information. Obviously, in such cases it is quite unlikely that the qualification expressed by the adverb itself could be salient in the discourse.

h. *Word order*

A last observation, which might again raise suspicion that despite the above evidence the use of a modal adverb may nevertheless somehow involve an

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19. This indicates that the notion of a ‘sentence adverb’ should be used with care. Adverbs of this type are clearly not term adverbs, since they are not part of the internal organization of a term, but belong to a higher level of organization. Thus, they are of the same category as the real sentence adverbs to the extent that they operate somewhere at the level of sentence structure, but they nevertheless do not affect the entire sentence (or even the asserted part of it — see Section 1.4c).

element of informational salience, relates to the syntactic position of the adverb in the utterance. If we confine ourselves to main clauses, the default placement of the adverb seems to be in sentence-internal position. In English this must be the position immediately preceding the main verb, as in *they have probably run out of fuel*. But in Dutch and German there is considerable freedom in this respect, to the extent that this can be nearly anywhere after the finite verb. As indicated in Section 2.1, this does not mean there are no principles involved. But they appear to have little to do with the informational status of the adverb as such. Thus, according to Verhagen (1986), in Dutch this is related to their scope over parts of information, which in turn is related to the topic/comment structure of the utterance (adverbs are 'comment modifiers' — cf. Section 1.4c). (The principles involved again apply to different semantic types of adverbs, not only epistemic ones.)

The adverb can also occur in sentence-initial position, however, as in *probably they have run out of fuel*.[20] In Dutch this does not happen very often: there are only 21 cases in the corpus, on a total of 133 relevant cases, i.e. 15.8%.[21] In German, however, this adds up to 29 on 126 relevant cases, i.e. 23%. (There is actually a remarkable difference between spoken and written language: in spoken language sentence-initial cases add up to only 8.3% for Dutch and 7% for German, but in written language this is 18.6% for Dutch and an impressive 43.6% for German. Why this should be so is open for further investigation.) As Verhagen argues, sentence-initial position of an adverb does not relate to a specific scope, it is 'scope neutral', so to speak, and the adverbial remains a 'comment modifier'.

Now, sentence-initial position has traditionally been considered very sensitive to information-structural factors (cf., e.g., the definition of the 'P1'-

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20. Not all epistemic adverbs can easily go to sentence-initial position though. Most of them do, but there is at least one exception (in all three languages considered here, it seems): *zeker, sicher(lich), certainly*. Thus, ??*zeker kom ik vanavond naar huis* or ??*sicher(lich) komme ich nach Hause heute abend* or ??*certainly I am coming home tonight* are all rather marginal, while their equivalents with sentence-internal position of the adverb are all fine. Another strong adverb such as *surely* in English (which is probably more evidential than epistemic though) does allow preposing, however. I have no explanation for this observation.

21. Excluded from the relevant cases are, for Dutch and German, the (respectively) 48 and 23 backgrounding cases mentioned in (g) above, plus (respectively) 11 and 10 cases in which the adverb occurs in a complement clause. The adverbs in sentence-initial position do not include the few absolutive cases mentioned in (f) above.

position in the theory of Functional Grammar — Dik 1989a, 1997a): it is often used for the placement of constituents with special informational status, such as focal constituents (especially contrastive ones). In view of this, one may wonder what could cause the adverb to go to this initial position, if not its informational status. A full answer would require an analysis of principles of word ordering and their implementation in the corpus which goes far beyond the present aims. But at first glance there seem to be at least two elements which may play a role here.

– No doubt, information structure does play a role, yet probably not the informational status of the adverb itself, but rather of one of the other constituents in the clause, and especially of the subject. In Dutch and German, which both have verb-second order in the main clause, the default filler of the initial position is the subject, especially when it is a 'given topic' in the discourse (see Dik 1989a: 359ff, 1997a: 420ff). Yet, if there is a constituent in the clause with a special type of strong focus (e.g., contrastive focus), this constituent may be placed in initial position, and the subject then occurs in postverbal position. If there is no reason for placing a focal constituent in initial position, however, but if the speaker nevertheless has a reason for not having the subject in its default initial position (e.g., when it is not a given topic in the discourse), the initial position is vacant. Since filling it is obligatory, some other constituent must go there, even if it does not have any special informational status. Very often adverbials are used for this, and this process may thus cause cases with a sentence-initial modal adverb.
– Another element which may effect sentence-initial position of the adverb is more stylistic in nature. It has been argued that there is a tendency in languages to order constituents in a clause in terms of increasing internal complexity: simpler constituents tend to precede more complex ones. (See, e.g., Dik 1978: 189ff, 1989a: 351, 1997a: 411f, who called this the 'Language Independent Preferred Order of Constituents' or LIPOC principle.) Since modal adverbs clearly belong to the category of quite simple constituents, this may sometimes be a reason to order them initially, in particular when the subject has a more complex structure (a full NP, e.g.). Of course, this often means that the subject is then not a given topic, since given topics tend to be pronominal. So the effect of

the complexity of constituents is not always clearly separable from the previous factor, and is certainly not incompatible with it.

It is not clear whether these two principles can cover all cases with a sentence-initial modal adverb, or whether still other principles are at work. In any case, in all corpus instances with the adverb in initial position the focus is clearly on information elsewhere in the utterance, and not on the adverb. Hence the sentence-initial position of the adverb is clearly not triggered by informational salience of the adverb.

So much for the corpus-based observations underscoring the fact that information structure crucially differentiates between the speaker's choice of a modal adverb or a modal adjective in discourse. These observations are even further strengthened by the fact that several of the behavioral properties of these expression types noted in the literature can be ascribed to their possibilities in this functional domain. Consider the following.

i. *Questioning*
Information structure provides a second explanation (probably complementary to that in terms of the possibilities for descriptive usage of the expression types — see Section 2.3) for the observation mentioned in Section 2.1 that modal adverbs cannot be questioned while adjectives can. If the point is to question the epistemic qualification (as in (12): *is it probable that they have run out of fuel?*), the expression of the qualification is the focus of the utterance. Hence, one must use a construction with a modal adjective for this purpose.

j. *Rejecting an epistemically modalized utterance*
Rejecting a speaker's utterance tends to get a different interpretation depending on whether (s)he has used a modal adverb or a modal adjective (Bartsch 1972: 35f). Consider (66) and (67).

(66) A: It is probable that they have run out of fuel.
B: That's not true.

(67) A: Probably they have run out of fuel.
B: That's not true.

Normally, reactions of this type address the most important (focal) information which has been conveyed by the foregoing utterance. Hence, in (66) the default reading tends to be that B reacts to A's claim regarding the probability

of the state of affairs. So B could continue: *it's even very unlikely that they did*. In (67), however, B clearly reacts to the assumption that *they have run out of fuel* as such, and not to the issue of the probability of that state of affairs. Hence B could continue: *they had a flat tire*.

k. *Contrast*
The same reasoning accounts for the observation that modal adjectives can be used to contrast two qualifications, as we have observed in (d) above, and as is shown again in (68), whereas corresponding combinations with modal adverbs, as in (69), are impossible.

(68) It is not only possible, but even probable that they have run out of fuel

(69) a. *Not only possibly but even probably they have run out of fuel
b. *They have not only possibly but even probably run out of fuel

As argued, contrasting qualifications automatically puts them into focus. See Lang (1979: 207ff) for other, similar observations involving coordination and comparison of qualifications, which can all be explained in the same way.

l. *Negating an epistemic qualification*
Similarly for the observation that if one wants to negate an epistemic qualification, one cannot use a modal adverb (Bartsch 1972: 34; Lang and Steinitz 1977: 51ff; Lang 1979: 207), but only a modal adjective, as is shown in (70) and (71).

(70) It is not probable that they have run out of fuel

(71) a. *Not probably they have run out of fuel
b. *They have not probably run out of fuel

Obviously, negating something puts it into focus.

This issue should not be confused with the simultaneous qualification of the state of affairs in terms of negation and modality as discussed in (a) and (e) above and in (m) below. As was indicated before in this chapter, (70) is ambiguous in this respect. The negation can either be taken to cooperate with the adjective to express a negative polar epistemic qualification of the state of affairs in the embedded clause (which is semantically equivalent to the incorporated *improbable*; this was the reading discussed in (a) above). Or it can be taken to negate the modal qualification. The latter is the reading

intended here. The structure of the latter is *not [probable [they have run out of fuel*]], and this reading cannot be rendered in a construction with a modal adverb, as is shown in (71). The structure of the former reading is *not probable [they have run out of fuel*]. As noted in (e), this reading can be rendered in a construction with a modal adverb, albeit not by means of a negative modal adverb (see (m)), but only by using a (positive) modal adverb and a marker for sentence negation in one and the same clause: *they probably haven't run out of fuel*.

m. *Negative forms*
Information structure also provides a straightforward explanation for the observation mentioned in Section 2.1 that there are no (semantically) negative modal sentence adverbs (although formally they are conceivable since they do exist at the term level). Since negative polarity is inherently salient, and since modal adverbs are used for non-focal expressions of epistemic qualifications (or at least their scalar component), combining the negative and the scalar component of a qualification in a negative modal sentence adverb would lead to a conflict in this respect. In this case, the negative polar component simply needs expression separately from the scalar component. In other words, the absence of negative modal sentence adverbs is a nice illustration of an information-structural effect which has been grammaticalized.

n. *Further modification of the epistemic expression*
A last observation in this long list of arguments for the role of information structure in choosing between an adverb and an adjective concerns the possibility to further modify the epistemic expression in function of the exact position of the evaluation on the epistemic scale. There is only a limited possibility to do so with the adverbs: English *most probably*, Dutch *zeer waarschijnlijk* or *hoogstwaarschijnlijk*, and German *sehr wahrscheinlich* or *höchstwahrscheinlich* seem the only acceptable combinations. Other combinations, such as English *rather probably*, *highly probably*, *very probably*, etc. are all very difficult or impossible (similar observations apply in Dutch and German). This limitation does not exist with the adjectives: cf. *quite probable*, *rather probable*, *highly probable*, and what have you. As I have also argued regarding double negative epistemic expressions in a above, expressing a more subtle or nuanced epistemic evaluation is likely to be correlated with

at least some degree of informational importance of the evaluation in the discourse context. There may be a particularly strong correlation with contrastivity (which is present in most adjectival uses), since contrasting epistemic qualifications automatically seems to imply that one has explicitly thought about them and has come to a fairly precise conclusion. Whence the adjectives' much wider range of possibilities to express subtle nuances.

Despite all the foregoing, one seeming exception to the principle that adverbs cannot be focalized is their use in echo utterances. This concerns cases in which a speaker reacts to an interlocutor's statement by literally repeating the (relevant parts of the) latter and correcting in it those elements with which (s)he does not agree. To freely adapt an example from Verhagen (1986: 161), upon a statement that *de burgemeester zal aanwezig zijn* 'the mayor will be present', an interlocutor, knowing better, may reply *de burgemeester zal misschien aanwezig zijn, bedoel je* 'the mayor will perhaps be present, you mean', thereby giving the adverb sentence stress. Similar German examples are provided by Bartsch (1972) and Lang and Steinitz (1977): they cite cases in which a speaker repairs an inappropriate adverbial in an interlocutor's utterance by repeating the original utterance, yet with a cancellation of the adverbial through metalinguistic negation, and the addition of a more appropriate adverbial. In such cases both adverbials receive heavy stress. E.g., *er kommt nicht wahrscheinlich, sondern sicher* 'he will not come probably, but certainly'. Clearly, in all these cases the adverbials are the focal information in the utterance. But, equally clearly, these are not normal cases. The very special effect achieved by such echo reactions lies in the exact repetition of the interlocutor's utterance. Hence, in order to make his/her point while preserving the original syntactic pattern as much as possible, the speaker can/will use linguistic means in forced ways. In such contexts, (practically) anything goes. Such cases should therefore not be included in considerations of what is normally possible, and cannot count as counterexamples.

To summarize, there is considerable evidence for the role of information structure in choosing between a modal adjective and a modal adverb. There are convincing indications that the adverb is never used when the epistemic qualification is focal information in the clause, but that the adjective is preferentially used under those conditions. Specifically, the adjective is used when the epistemic qualification acquires a position of contrastivity in

discourse (this seems to account for all cases in which the adjective is focal in the corpora).

Thus, the suggestion made at the beginning of this section that the adjectival pattern is some kind of a cleft variant of the adverbial pattern is adequate. One aspect of our observations above is remarkable in this context, though, viz. the radicality of the distinction. Normally, using a cleft construction is only the most radical way to focalize a constituent: the clefted constituent can also be focused in the non-cleft pendant of the sentence, for example by giving it main sentence stress and putting it in initial position. But precisely this milder way of focusing appears not available in our present case. The question is why this should be so. The answer may be found in the fact — which is already latent in the foregoing discussion, and will become increasingly apparent throughout the following chapters — that epistemic qualifications actually have a special type of informational status. As we will see later, in general, focalizing them is a rather exceptional thing to do. Hence, in the few situations in which this does happen, it may simply be felt necessary to immediately use the most radical means for expressing salience, viz. a cleft-like construction, so as to make sure the focality of the qualification is quite apparent. Moreover, as we have observed (and will observe again in the next chapters), when epistemic qualifications do get focalized this is usually or even exclusively for reasons of contrastivity. And contrastive focus is known to typically draw radical expressive devices, such as clefts (cf. Givón 1990: 704ff). Of course, since the adjective appears to be primarily used to focalize the qualification, the rarity of focal cases then also explains the infrequency of the adjective as compared to the adverb (as shown in Table 2 in Section 2.1) or any other epistemic expression type (as we will see in the next chapters). To fully appreciate this explanation, however, the wider context of the informational status of the other epistemic expression types is required. To be continued, thus.

2.5 Discourse strategy

The fourth factor introduced in Section 1.4 as relevant for understanding the differences between the alternatives in our paradigm of epistemic expression types, viz. discourse strategy, does not appear to play any particular role in the uses of *waarschijnlijk* or *wahrscheinlich*, either as an adverb or as an adjective.

There are no occurrences in the corpus data in which they are manifestly used by the speaker to achieve any specific type of special effect in discourse.

Carretero (1996: 258) argues (on the basis of corpus data) that the English equivalents *probably* and *perhaps* can be used strategically, to 'mitigate unfavorable or compromising information', quite like the mental state predicate *think* (see Section 3.5). Her examples leave some doubt, though (but this may partly be due to lack of a wider context). E.g., in *I'm afraid I probably sounded rather bad-tempered, but I felt a bit bad-tempered because* … one may wonder whether the speaker is not just aiming to say that (s)he does not know for sure whether (s)he sounded bad-tempered. Without the modal adverb the expression does not seem to sound less mitigated, in the sense that it would come across as more unfavorable or compromising toward the hearer (the crucial mitigator here seems to be *I'm afraid*). It does sound more certain, of course, but one should avoid calling any expression of epistemic uncertainty a case of strategic mitigation (as compared to an expression of epistemic certainty, or an epistemically unqualified expression which implies certainty), since that would leave the notion of strategy void of meaning. Admittedly, precisely defining strategy is not an easy task, and the borderline between strategic and non-strategic uses is very fuzzy.

It should be stressed that the observation regarding the absence of strategic uses may not be generalizable to all modal adverbs and/or adjectives, though. Unlike the analyses concerning all foregoing factors, which are most probably applicable to the entire categories of modal adverbs and adjectives, the possibilities for (specific types of) discourse-strategic uses may be expected to be much more strongly bound to individual lexical forms and their specific properties (not only for the adverbs and adjectives, actually). For example, the exact degree of likelihood expressed by the different adverbs and adjectives (i.e. their exact position on the epistemic scale) is potentially important in determining whether, and in which way, each one can be used to achieve specific (derived) effects. Any further claims in this connection will therefore require additional investigation (and see also the discussion of discourse strategy relating to the auxiliaries in Section 4.5 below).

Also, the fact that the corpus data do not reveal any special strategic uses of the forms considered does not mean that they are not subject to strategic considerations on the part of the speaker at all. On a purely intuitive basis it

is obvious that they are: no doubt, in mapping an epistemic evaluation onto an adverb or adjective the speaker will sometimes adjust the degree of likelihood and make the expressed evaluation relatively stronger or weaker, e.g., in view of the nature of the subject matter talked about and its expected effect on the listener (cf. the effect of the nature of the state of affairs on the interpretation of epistemic judgments of it shown in McGlone and Reed 1998). Maybe this is the kind of adjustment Carretero is referring to with her examples above. Such a type of strategic adjustment is obviously hard to detect in a corpus study, because it is normally hidden. There are no further linguistic or other signs for the fact that the speaker is adjusting the expression of his/her evaluation in one or another direction, and there is no means of knowing the speaker's actual evaluation in any other way. This is quite unlike the types of strategic uses we will encounter in the next chapters, such as politeness or interaction management strategies, which are detectable, and should be if they are to serve their purpose. Very often it will even be the speaker's aim that the present type of strategic adjustment should not be detected, however. After all, it basically works the same way as lying, which also involves a misfit between conceptual and linguistic contents. The difference lies in the extent to which there is a misfit, and/or in the importance of this misfit in the discourse context, and/or in the exact purpose of the misfit. Usually, unlike lying, strategic adjustments in the above sense are not meant to mislead the listener.

This type of strategic adjustment of the epistemic expression is certainly not typical for the adverbs and adjectives anyway: it no doubt also occurs in the choice of any other epistemic expression, and of whichever expression for whatever type of speaker evaluation involving scalarity for that matter. So it does not differentiate between the different expression types at all.

2.6 Summing up

The functional differences between the modal adverbs and adjectives in terms of the factors discussed are (roughly) summarized in Figure 1. In this figure, '−' means that an expression type is never triggered by the relevant functional dimension; '(+)' means that it can be, and on occasions is triggered by the dimension, but that this is not a major factor in its use; '+' means that the dimension is frequently responsible for the selection of the

relevant form type; and '++' marks the dimension which may be considered most important for understanding the use of the expression type. For each factor, only the critical dimension is indicated. E.g., for performativity the possibility for performative uses is not listed as this is the default usage of epistemic expressions, hence all of them have it. Discourse strategy has completely been omitted from this figure since it is not a relevant factor for the present expression types.

Clearly, the opposition between these two expression types is maximal: the adverb is negative across the board, while the adjective offers possibilities regarding each of the factors considered (mainly due to the specific type of syntactic patterns it brings along). But, to repeat, focality of the epistemic qualification appears by far the most frequent cause for using this form type. In fact, there are only very few cases of the adjective in the corpus which do not seem to be — at least in part — due to this element. The different factors are not mutually exclusive in determining the use of the adjective, however. That is, a single occurrence of it may be positive for one of the factors listed, but also for more factors simultaneously. For example, in some focalized uses the possibility to express (inter)subjectivity seems to play a role as well.

These three factors together appear to provide a full account, not only for the behavior of the two form types in the corpora, but also for (nearly) all of their syntactic, semantic, and discourse-interactional features noted in the literature. There is little reason, then, to follow the conclusion (cf. Section 2.1)

	epistemic qualification (probability of the SoA)	
	↙	↘
evidentiality:		
(inter)subjectivity	−	+
performativity:		
descriptive use	−	(+)
information structure:		
focalized use	−	++
	↓	↓
	adverb	*adjective*

Figure 1. *Factors in the use of modal adverbs vs. adjectives*

that they must express two different types of epistemic qualifications. There is just one last observation which I have not accounted for yet, and which relates quite directly to this issue of two types of epistemic qualifications: it appears possible to combine an adverb and an adjective of quite different strength in one utterance (Foley and Valin 1984: 220; Dik 1989a: 251–252, 1997a: 296; Hengeveld 1989: 139), as is shown in (72).

(72) It is certainly possible that they have run out of fuel

Surely, it cannot be that a speaker can express two evaluations of the same semantic category but with a radically different value in one utterance, since that would involve a contradiction (an assumption which is absolutely unexceptionable). Hence — so it has been argued — the adverb and adjective in (72) (and thus, presumably, quite in general) must express two different types of epistemic qualificational categories.

The question is whether this conclusion is warranted. If the above reasoning were correct, one would assume that all possible combinations of adverbs and adjectives should be possible. But that is clearly not the case. In particular, replacing the adjective in (72) with stronger alternatives leads to unacceptable results, and this remains so if one replaces the epistemic adverb *certainly* with weaker alternatives, as can be seen in (73).

(73) a. *It is certainly probable that they have run out of fuel
b. *It is certainly certain that they have run out of fuel
c. *It is probably probable that they have run out of fuel
d. *It is possibly probable that they have run out of fuel
e. *It is probably certain that they have run out of fuel
f. *It is possibly certain that they have run out of fuel

On the other hand, replacing *certainly* in (72) with weaker adverbs while maintaining the adjective does seem possible, yet not without limitations either, and the results certainly require highly specific contexts to make them feasible. Dutch and German actually seem to allow more than English in this respect, as can be seen in (74). (The Dutch and German particles *wel* and *schon* in the (b) and (c) sentences — impossible to translate into English —

add a very subtle concessive and/or ‘considerative’ meaning to the utterance.[22] Including them makes these expressions much better acceptable.)

(74) a. *Het is mogelijk(erwijze) mogelijk dat ze zonder benzine gevallen zijn
a′. *Es ist möglicherweise möglich, daß ihnen der Sprit ausgegangen ist
a″. *It is possibly possible that they have run out of fuel
b. Het is misschien (wel) mogelijk dat ze zonder benzine gevallen zijn
b′. Es ist vielleicht (schon) möglich, daß ihnen der Sprit ausgegangen ist
b″. ?It is maybe possible that they have run out of fuel
c. Het is waarschijnlijk (wel) mogelijk dat ze zonder benzine gevallen zijn
c′. Es ist wahrscheinlich (schon) möglich, daß ihnen der Sprit ausgegangen ist
c″. ?It is probably possible that they have run out of fuel

What we really have in (72) and (74), then, is not a combination of two types of epistemic modality, but rather an epistemic evaluation, expressed in the adverb, of a dynamically modalized state of affairs, dynamic modality (see Section 1.3) here being expressed by the adjective *possible*, *mogelijk*, *möglich*. Of course, there are not many circumstances in which a speaker would want to do something of this kind, which is why one needs some imagination (and the help of particles which attune cases more clearly to specific contexts, as in the Dutch and German examples in (74)) to see how such examples could work. In this perspective, (74a/a′/a″) are probably unacceptable because of the formal similarity of the adverb and adjective, i.e. for purely stylistic reasons. The combinations in (73) are impossible because the adjectives *probable* and *certain* cannot express dynamic modality, but only epistemic modality. In view of the principle that one cannot combine two different epistemic qualifications in one utterance, their unacceptability

22. By ‘considerative’ I mean that the speaker indicates that (s)he is taking up a suggestion uttered by the interaction partner which, after having thought about it, (s)he considers an acceptable proposal — acceptable to the extent indicated by the epistemic adverb. These Dutch and German particles are actually not completely equivalent in the nuances they express.

thus even lends direct support to the assumption that the adverb and adjective in them probably **do** involve the same semantic category of epistemic modality, but with a different degree of likelihood.

In conclusion, then, all available evidence supports the assumption that the functional differences between the epistemic adverbs and adjectives have nothing to do with (differences in) the semantic category of epistemic modality as such. They are rather due to a variety of other dimensions, of more general applicability to language use, but with particular features relating to the special case of epistemic modality. Thus, note also that many or most of the behavioral properties of the two expression types reported in the literature and discussed above are not limited to epistemic cases: they can be observed for most or all semantic types of sentence adverbs and their adjectival counterparts, if they have one (see Bartsch 1972). This is, of course, again fully in line with the present analysis. It seems, then, that the earlier analyses of the adverbs and adjectives presented in Section 2.1 above have been suffering from a special type of what Langacker (1987: 28) calls the 'exclusionary fallacy' (a problem which is quite widespread in linguistic argumentation, and even beyond it in science in general), viz. the tendency to try to explain a particular superficial linguistic distinction in terms of one single underlying factor. The analysis of the forms has shown how harmful such a tendency can be: it has not only prevented a full understanding of them, but it has even lured researchers into counterintuitive and theoretically unattractive assumptions, since it has tricked them into a completely unnecessary dissolution of an otherwise semantically coherent phenomenon. In any case, for the present purposes, our paradigmatic approach is clearly still on track.

Chapter 3

Mental state predicates

3.1 Some lexical-semantic and grammatical properties

The next stage on our tour through the paradigm of epistemic expression types features the mental state predicates, or 'propositional attitude predicates', as they are sometimes called, of the type illustrated in (75).

(75) I think they have run out of fuel

These predicates are notoriously difficult to deal with, much more so than the adverbs and adjectives, mainly because of their complex semantic structure and their mysterious linguistic behavior, which often defies standard expectations regarding the grammatical category of verbs.

Probably due to this, there is little in-depth literature to help us unravel the properties of this expression type. Surely, there has been considerable attention for propositional attitudes and predicates expressing them (specifically for belief and the predicate *believe*) in philosophy and, in its wake, in part of cognitive psychology (see, e.g., Mudersbach 1984 on the former, Egan 1986 on the latter). But most of this literature is of little help to our present concerns. Usually it is not concerned with the usage properties of linguistic forms, but with the theoretical status of general concepts, and the notions involved often do not even correspond to our present topic. Thus, Egan (1986: 315) defines belief as "the cognitive act or state in which a proposition is taken to be true", but we are concerned here with evaluations of truth. Moreover, especially the logical-philosophical literature often deals with issues which are not very illuminative from our present cognitive perspective.

Thus, one type of problem commonly discussed in this literature is whether someone who believes something should also believe (all) its consequences, or whether someone can believe contradictory things. Such questions are typical artifacts of a truth-conditional approach, but in an

empirical, conceptual-semantic perspective, the answers seem obvious. Yes, people sometimes do believe contradictory things, and they do so because they are not aware of, or even do not care about the contradiction. And, no, people do not always believe all consequences of their beliefs, since they are often not aware of (all of) them. In fact, in terms of a realistic concept of human world knowledge, what would it mean to know ‘all’ the consequences of something anyway? Another often debated problem is that ‘belief-sentences’ allow two readings, called the ‘notional vs. relational’, or ‘de dicto vs. de re’ readings (Quine 1956). Imagine a person named Ralph, who believes of a man with a brown hat that he is a spy. Hence we can say that *Ralph believes that the man with the brown hat is a spy*. Now, suppose we know — but Ralph does not know — that this man with the brown hat is identical with a man named Ortcutt. We can also say, then, that *Ralph believes that Ortcutt is a spy*, although this is not what Ralph himself literally believes (his belief only involves the man with the brown hat, not Ortcutt). (Cf., e.g., Hintikka 1975: 164ff; Burge 1977; Haas-Spohn 1989; Rolf 1989.) As Searle (1983: 197ff) argues, however, this problem has again little to do with the semantics of propositional attitude predicates, but is entirely a matter of the way we report about beliefs (see also Rolf 1989). A speaker can either render someone’s thoughts in order to reveal the way that person was actually thinking them, i.e. ‘literally’ (the *man with a brown hat* utterance). Or (s)he can render someone’s thoughts in order to focus on the state of affairs involved in that person’s thoughts, and then the speaker can also use his/her own knowledge about the state of affairs to make it more specific (the *Ortcutt* utterance). Thus, this involves no more than the distinction between direct and indirect thought reports.

Linguistic investigations of the epistemic use of the mental state predicates, then, are hardly available. So in this chapter we will mainly have to start from scratch, using the functional analysis of the adverbs and adjectives in the previous chapter as our stronghold.

In terms of basic linguistic characteristics, however, apart from the difference in word class and corresponding syntactic possibilities, these predicates differ from the adverbs and adjectives in at least two respects, viz.: (i) unlike the latter they have both a qualificational and a non-qualificational meaning; and (ii) the nature of the qualificational meaning, and the

structure of the lexical class in this respect, is quite different from that of the adverbs and adjectives. Let us start with the latter.

a. *The nature of the qualificational meaning of the mental state predicates*
The class of mental state predicates expressing a qualificational meaning is less clearly delimited (is more open), and is also more variable across languages, than that of the epistemic adverbs and adjectives. Thus, for English the classical examples in the literature are *think*, as in (75), and *believe*, as in (76a), but a list of members of the category would at least also include those in (76b)–(76e). And there are no doubt more.

(76) a. I believe they have run out of fuel
b. I doubt (that) they have run out of fuel
c. I know they have run out of fuel
d. I suppose they have run out of fuel
e. I guess they have run out of fuel

That *think* should often figure as the prime example is no accident, as this is no doubt the most prototypical member of the category. Thus, Thompson and Mulac's (1991) investigation of the frequency of qualificational uses of these predicates in American English conversation has shown that only two of them occur frequently, viz. (mainly) *think*, and (at quite a distance) *guess*. As compared to these, other predicates are highly infrequent.[1] Also in terms of qualitative properties, *think* has a special position within this lexical class, as will become apparent in this chapter. Obviously, prototypicality is not an issue among the members of the class of modal adverbs and adjectives.

These observations for English are not simply transferable to other languages, not even to closely related ones, however. In Dutch, the cognate of *think*, *denken*, is also most prototypical (hence will figure as our Dutch case below). But in German, *denken* hardly occurs with a qualificational meaning. Instead, *glauben* 'believe' appears the most prototypical form (though it is less 'popular' than the prototypes in English and Dutch, as we will see; this verb will be our German case). On the other hand, neither the Dutch nor the German pendant(s) for *guess*, viz. *gissen*, and *raten* or *schätzen*

1. *Believe*'s use as a prime example in the literature, then, is not due to prototypicality (though *believe* may be relatively more important in British English), but to the fact that this predicate (and its nominal counterpart) figures as a crucial philosophical notion.

(German does not even have a real cognate) have a qualificational meaning. Dutch has *geloven* 'believe' as a fairly frequent alternative for *denken*, and German rather uses *meinen* 'mean' as a second best case (the Dutch equivalent *menen* is rarely used qualificationally, English *mean* has no such usage at all). For the rest, Dutch and German do have equivalents for *doubt*, viz. *betwijfelen*, *bezweifeln*, and for *know*, viz. *weten*, *wissen*, and Dutch has an equivalent for *suppose*, viz. *veronderstellen*. But they also have several other forms, at least including *aannemen* and *annehmen* (whether English *assume* can be used qualificationally is unclear), and *vermoeden* and *vermuten* (*presume* seems outdated). But, again, there are no doubt more forms (in German even *rechnen* is sporadically used qualificationally — cf. Andersson and Kvam 1984).

Moreover, there is only a thin borderline between the mental state predicates and some other categories of predicates sometimes used to express a similar kind of speaker qualification. This includes the communication predicate *say* in (77) (and Dutch and German *zeggen* and *sagen*), and some perception predicates such as *hear* in (78) (and Dutch and German *horen* and *hören*). Of course, unlike the cases in (75)–(77), *hear* in (78) has no epistemic meaning, but a purely evidential meaning of 'hearsay'. But the role of evidentiality in the meaning of the mental state predicates will be addressed below.

(77) I would say they have run out fuel

(78) I heard they have run out of fuel

The class of mental state predicates is not only more open, it also has a quite different semantic organization as compared to the modal adverbs and adjectives. The major dimension in the latter is the epistemic scale: individual adverbs and adjectives express a quite specific position on that scale — (im)possibility, (im)probability, (un)certainty. This dimension is to some extent also relevant for the mental state predicates: *know* is clearly stronger than *think*, and in combination with negation (*don't know*) it takes the neutral mid-scalar position; and *doubt* refers to the negative side of the scale. But its role seems minor: the difference between *think*, *believe*, *suppose* and *guess*,

e.g., has little to do with this.[2] In fact, unlike the adverbs and adjectives, each of these predicates is quite vague regarding the strength of the qualification expressed: they simply indicate that it is somewhere on the positive side of the epistemic scale (i.e. beyond mere possibility). Context may cause a more specific reading, but in neutral situations, the reading seems inherently non-specific.

The difference between individual mental state predicates is rather due, then, to a meaning element other than epistemic modality. This is not immediately apparent if one considers *think* or *believe* (or *doubt*) alone, but it does surface if one spells out the meaning of a few other predicates in (76). For instance, *know* means: 'I consider it (quite) certain/I am convinced that they have run out of fuel, although I have no hard proof for it and can only say so on the basis of intuition'; *suppose* means: 'I consider it likely/I expect that they have run out of fuel, because I have good evidence for it'; and *guess* means: 'I consider it probable that they have run out of fuel, even though I have no firm evidence for it'. Clearly, each of these involves not only an epistemic meaning, but also a prominent evidential one. As we will see in Section 3.2, the same is true for *think* and *believe* (or rather their Dutch and German equivalents, but this no doubt extends to English as well), even if their evidential meaning is less conspicuous. This combination of an evidential and an epistemic meaning is one of the most central characteristics of this expression type in general.

The literature is actually ambivalent on this matter. Usually, the mental state predicates are characterized as epistemic (e.g., Perkins 1983; Noonan 1985; Hengeveld 1988; Thompson and Mulac 1991; Aijmer 1997; not all of these distinguish between epistemic modality and evidentiality or keep them clearly separated though). But some authors seem to dispute this. For example, De Schutter and van Hauwermeiren (1983) include the Dutch mental state predicates in the wider category of expressions of what they call 'subjective restriction' (a notion reminiscent of subjective evidentiality), and for them epistemic uncertainty is not a proper part of the meaning of these predicates, but is only implied. Likewise, Chafe (1986) characterizes English

2. Aijmer (1997: 16ff) claims that all mental state predicates, like other epistemic expressions, can be plotted on a scale of 'degree of reliability'. The status of this notion is not entirely obvious to me, but if it should mean 'degrees of strength of the epistemic judgment', I disagree.

believe and *think* as expressions, not of ‘reliability’ (i.e. epistemic modality), but of ‘modes of knowing’ (a semantic category also including ‘true’ evidentiality), thus only carrying implications as to degrees of reliability.

The question is, of course, how to draw the borderline between an implicational and an inherent meaning. Also, not all mental state predicates need to be alike in this connection: as suggested above, the evidential dimension of predicates such as *know*, *guess* or *suppose* may be more dominant than that of *think* or *believe*. In fact, the nature of the evidential meaning appears different in the two groups. In the former, it belongs in the realm of the traditional evidential category of inferentiality (indicating the quality of the evidence for the inferential process). *Think* and *believe*, however, have evidential meanings in the realm of (inter)subjectivity, as I will show in Section 3.2. (Some predicates in the former group — e.g., *guess* — may have such a meaning as well, but the predicates in the latter group do not have an inferential meaning.)[3] At least for *think* and *believe* (and their Dutch and German equivalents), then, the epistemic component seems much too strong to be reduced to a mere matter of implication. Intuitively and on the basis of the corpus data discussed below, it is clear that these predicates are often used by speakers to express epistemic probability, and not just in some indirect way but as a central element of the expression. (But the evidential meaning always seems present too, and, likewise, not as an implication but as an inherent and sometimes quite important component.)[4]

To further support this, consider the possibility for these predicates to

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3. The former group of predicates is thus comparable to adverbs such as *presumably* or *supposedly*, which also have an inferential meaning possibly in combination with an epistemic one (see Section 2.1). It is no accident that these adverbials are all derived from corresponding mental state predicates, of course. For *think* or *believe*, however, there are no real equivalents among the adverbs and adjectives. As mentioned in Section 2.2, the adjectives’ (inter)subjective meanings are syntactic, not lexical; as I will argue in Section 3.2 below, for the mental state predicates these are lexical.

4. Aijmer (1997: 12ff) suggests that one can distinguish between ‘belief’ and ‘opinion’ uses of *think*. I am not sure how to understand these notions, but if they stand for epistemic and evidential uses in the present analysis, I do not subscribe to her view. I do agree, intuitively, that some qualificational uses of this predicate may be more evidential and others more epistemic, but that does not mean that in such cases the other meaning is not present as well. In any case, in analyzing corpus data (for Dutch *denken*, at least) it turns out impossible to separate these types of uses: even if one meaning sometimes appears to dominate, the other can never be excluded.

occur in contrast with an unsuspected epistemic expression, a feature which can be taken to mean that the contrasted forms involve the same semantic dimension but with distinct values. Such a contrast is out of the question with a purely evidential (hearsay) predicate such as *hear* — (79c) — but it is perfectly feasible with *think* — (79a). It is somewhat more difficult to do this with a predicate such as *suppose*, though — (79b) — which supports the assumption that one should differentiate between (groups of) mental state predicates as to where the balance between the epistemic and the evidential meaning component lies.

(79) a. I not only think they have run out of fuel, I am certain of it
b. ?I not only suppose they have run out of fuel, I am certain of it
c. *I not only heard they have run out of fuel, I am certain of it

Hence, I will continue to assume that *think* and *believe* are epistemic predicates, albeit not only or not purely epistemic ones, but mixed epistemic-evidential ones.

b. *Qualificational vs. non-qualificational meaning*
Another semantic property distinguishing the mental state predicates from the adjectives and adverbs (one probably not unrelated to the more open nature of the former class) is that they also have a non-qualificational meaning. (The global principles of the following apply to all three languages considered here.) This meaning is different for each predicate, but it can generally be characterized as 'being in mental state X' or 'performing mental process X'. Thus, *think* is the mental process of reasoning with knowledge; *believe* is the mental state of faithfully trusting information (from someone); *guess* is the mental process of tentatively estimating something; *know* is the mental state of having knowledge about something; *suppose* is the mental process of hypothetically putting forward something in order to be able to use it as a premise in a reasoning process; etc. Also the related predicates in (77) and (78) have a non-qualificational meaning: *say* obviously also means 'to express verbally', and *hear* also refers to the perceptual process of hearing.

In the literature, this 'non-qualificational' meaning is sometimes treated as if it were a type of qualification of a state of affairs as well. After all, also in this reading the mental state and similar predicates concern states of affairs expressed in subordinate domains (albeit of quite different syntactic shapes; see below). For example, in accounts of what has been called the

direct perception vs. indirect inference reading of perception predicates, as in *I saw him sleeping* vs. *I see that he was sleeping* (the latter meaning ‘I now realize that …’; see, e.g., Kirsner and Thompson 1976; Frajzyngier 1991, 1995), one sometimes gets the impression that both readings are taken to involve different types of evidentiality. Hengeveld (1988) even explicitly characterizes the two meanings of *believe* as both involving epistemic modality: the qualificational reading objective modality, and my non-qualificational reading subjective modality.[5] However, the mental state or mental process or perception or communication readings of these predicates do not involve a qualification of their state of affairs in any straightforward meaning of this notion. They all simply refer to different dimensions of human information processing behavior, as normal ‘facts in the world’ which one can observe, know, and talk about.[6] Of course, trivially, information processing involves a process as well as information processed, hence talking about such processing often requires not only an expression to characterize the process, but also one to characterize the information processed. But the former does not involve a speaker evaluation of the latter in the way that a qualificational mental state or similar predicate does. Rather, the latter neutrally specifies the ‘object’ of the former. So it is fully warranted to call this meaning non-qualificational, and to keep it clearly separated from the problem area of speaker qualifications of states of affairs, such as epistemic modality.

There is a very apparent link between the qualificational and non-qualificational meaning of these predicates, and this suggests a historical connection between them (though at least for the most central predicates this

5. Hengeveld (1988) calls these readings ‘de re’ and ‘de dicto’, respectively. On earlier occasions (Nuyts 1992a) I have used these terms, too, but I will not further do so since they do not adequately render the difference between the two readings in the present analysis. The non-qualificational reading does not belong in the domain of reported speech. Moreover, these terms are used variously in the philosophical literature, and are therefore potentially confusing. Particularly concerning propositional attitudes, they are sometimes used more or less like Hengeveld’s notions (see, e.g., White 1975), but most often they are used to characterize a completely different distinction between readings of the predicates, viz. the one discussed above concerning belief-ascriptions such as ‘Ralph believes that the man with the brown hat/Ortcutt is a spy’.

6. See also Vet (1994: 66), although I disagree with his analysis to the extent that he does not seem to distinguish between descriptive qualificational uses and non-qualificational uses of mental state predicates (see later in this chapter).

is not a productive process anymore, in view of the syntactic and semantic independence of the two uses — see below). The non-qualificational meaning is clearly the 'literal' one, hence may be considered the original meaning. The epistemic meaning of *think* and *believe*, then, may have been able to develop out of the non-qualificational meaning because the latter essentially leaves open the reality-status of the state of affairs. While one is *thinking*, the result of the reasoning process is open. If one faithfully *believes* something on someone else's authority, one has not personally experienced its reality status. This 'factual openness' appears to have been exploited to indicate uncertainty on behalf of the speaker (see also Nuyts 1990a, 1992b: 315ff). And since openness is non-specific, the vagueness of the epistemic meaning (cf. (a) above) is no surprise either. Similarly, in the predicates with an inferential meaning, this inferential element can be related to their non-qualificational meaning. E.g., *supposing* something as a premise in reasoning implies that this 'something', though not attested, is firm enough to serve as a basis for further reasoning, whence the evidential component of reliability of one's information. The tentativity of *guessing* directly translates into absence of decent evidence. The reference to knowledge rather than facts in the world can easily be seen to motivate *know*'s evidential meaning of having strong intuitions but no hard proof. Also the epistemic element in these predicates (whatever its precise status) is clearly due to the non-qualificational meaning: the latter each time involves 'factual openness', too. Even the higher epistemic strength of qualificational *know* as compared to the other predicates is motivated by the non-qualificational meaning of having knowledge. I turn to the origins of the evidential meaning of *think* and *believe* in Section 3.2 below.

Louis Goossens (p.c.) has pointed out a potential problem for this analysis in the case of *think*. This predicate is a merger of two Old English predicates, viz. *þencean* en *þyncean*, and the two meanings may be due to these two original predicates (see also Aijmer 1997: 10ff). In fact, in modern Dutch and German there still are two predicates, like in OE: next to *denken* there is (albeit archaic) *dunken* in Dutch and *dünken* in German. Like *þyncean*, both only occur in an impersonal construction, and both mean something like 'it appears to me that …', which may count as a qualificational meaning. This observation does not preempt the above analysis, however. The existence of the two meanings is not a property of *think* and

denken alone, but is common to all mental state (and similar) predicates, and this begs for a coherent explanation for all cases. But it seems unlikely that all those other cases also originate in two predicates. In fact, the close formal resemblance between the two predicates from which *think* and *denken* derive is an argument to assume the same historical origins for them as well. In any case, the clear and very systematic semantic relationship between the two meanings in all these predicates, as pointed out above, is a strong argument in favor of a derivational relationship.

The difference between the qualificational and non-qualificational meaning of the mental state predicates is reflected in the syntactic patterns in which they occur. (For ease of presentation I will henceforth mainly focus on *think* and *believe*, but similar observations apply for the other predicates.) The non-qualificational meaning occurs in a variety of syntactic patterns which are idiosyncratic (and sometimes even language-specific) for each predicate. For example, *think* typically occurs intransitively, as in (80).

(80) a. Shut up, I am thinking
b. Hm, good question — let me think for a while

Non-qualificational *believe* is typically used with a simple transitive pattern, as in (81a-b), but it can also take a complement, as in (81c) (to be interpreted as ‘I accept that …’).

(81) a. I believe you
b. I believe this story
c. I believe that this story is true

Both predicates moreover combine with a few fixed prepositions, as illustrated in (82), and *think* can also be used to introduce a quote, as in (83).[7]

(82) a. I am thinking of going home today
b. I have been thinking about your proposal
c. I don’t believe in miracles

(83) a. He thought: What the hell are they doing?
b. I thought: Oh no! Not again!

7. The meaning of these predicates in (82)–(83) vs. (80)–(81) is not always fully identical (e.g., (82a) appears a case of what Aijmer 1997: 12 calls the ‘intentional’ meaning of *think*), but is clearly related. The nature of the differences is beyond the scope of my present concerns.

The qualificational meaning, on the other hand, essentially (see Section 3.4 for a more detailed picture) occurs in two basic syntactic patterns, applying to all mental state predicates. Either the predicate is complemented by a *that*-clause or a reduced variant of it, as in (84). This is the predominant pattern (see Thompson and Mulac 1991 on English and Section 3.4 on Dutch and German). In English and German the complementizer in the full form (84a) can and even tends to be omitted, especially in spoken language, but this is not possible in Dutch.[8] Alternatively, the predicate is used parenthetically, as in (85).[9]

(84) a. I think/believe (that) they have run out of fuel
b. I think/believe so

(85) a. It is dangerous, I think/believe, to run out of fuel in a desert
b. It is dangerous to run out of fuel in a desert, I think/believe

'Parenthetical' thus refers to a structural element which has no obvious grammatical link with the clause to which it pertains, but is either inserted as an interjection somewhere in that clause (there are limits as to which positions it can take, though), or is attached at the end of the clause, as an afterthought.[10] In English this structure can only contain the mental state predicate plus its subject. In Dutch and German it sporadically also includes a particle, e.g. Dutch *toch* or *wel* (the latter is not to be confused with the

8. Thompson and Mulac (1991) suggest that in English the qualificational reading of these predicates in the complementing pattern only occurs when the complementizer is omitted. This is clearly not true. For *think* in particular, even the complementing pattern with an explicit complementizer can practically only be understood qualificationally (see below).

9. Only *know* and *doubt* and their Dutch and German cognates appear to be exceptional in not allowing a parenthetical usage. One does have uses such as *it's difficult, I know, but let's try it anyway*. This does not involve the inferential/epistemic meaning of *know* mentioned above, however. Rather, it involves an argumentative, concessive meaning, which is directly based on the non-qualificational mental state meaning. For some reason the qualificational meaning 'it must be so' seems impossible in parenthetical uses of *know*. Why there should be no parenthetical *doubt* will be discussed in Section 3.4 below.

10. Urmson (1952) uses the term 'parenthetical' quite differently, covering all instances of mental state, communication, perception, and other predicates in their qualificational (as opposed to non-qualificational) usage, irrespective of their syntax. That is, they are also called such when they are syntactically complementing. His quite idiosyncratic usage of this term is thus semantically motivated, while I am using the term to characterize a syntactic property.

homonymous positive polar particle *wel*) or German *schon* (all impossible to translate into English), which slightly modifies the epistemic value of the predicate. In spoken language clause-internal parentheticals are often preceded and followed by a pause and an interruption in the intonational pattern of the main utterance. In Dutch and German, but not in English, parenthetical uses of a verb and subject are, moreover, characterized by inversion.

These two patterns quite systematically exhaust the syntactic possibilities of, and at the same time typify, the qualificational reading of all mental state predicates (and similar ones such as in (77)–(78)), and they do so cross-linguistically (apparently far beyond West Germanic). Thus, the qualificational reading is impossible in any of the other syntactic patterns in which the non-qualificational reading occurs. On the other hand, the non-qualificational reading systematically defies parenthetical usage (except for the 'quoting' use of *think* as in (83), which can be inserted in or attached after the quote). It does allow a complementing pattern in many predicates, even though complementizer omission then appears impossible or at least disfavorable, even in English and German. Individual predicates' tolerance for this pattern is variable, however. It is one of the normal patterns for, e.g., *suppose*. But for *believe* it is much more difficult: it requires some effort to read (81c) above non-qualificationally, and instances such as (86) are very rare both in the Dutch and German corpus.

(86) Niemand zal ons willen geloven dat de hond in een boom kan klimmen, en dan kunnen we de foto's tonen.
'Nobody will be willing to believe us that the dog can climb a tree, and then we can show the pictures.'

The complementing pattern is even harder to get for non-qualificational *think*.[11] There are no instances in my Dutch corpus, and there is no way to understand (84a) non-qualificationally. At best, one can imagine a case such as: *A: You are so quiet, what's up? B: I am thinking that it is time to leave*, but

11. Pace my own earlier assumptions (Nuyts 1992a). The problem is that I failed to distinguish between the non-qualificational and the descriptive epistemic reading (see Section 3.3) of these predicates. What I then called the 'de dicto' reading (following Hengeveld's 1988 terminology) is actually sometimes one, sometimes the other reading.

this is clearly a very marginal instance.[12]

The strong correlation between the qualificational reading of the mental state predicates and these two syntactic patterns is quite remarkable, of course. It suggests an inherent connection between these patterns and the functional structure of the qualificational meaning. I will pursue this matter further in the course of the following analyses and chapters.

The different syntactic possibilities of the qualificational and non-qualificational reading of predicates such as *think* and *believe* are also an argument to assume that at least for these predicates these meanings are no longer productively related. Thompson and Mulac (1991) have argued that the parenthetical and complementizerless complementing forms of the qualificational use of predicates such as *think* and *guess* reflect grammaticalization of this use. A weaker formulation in terms of a tendency towards grammaticalization would be more appropriate, given the existing variation and flexibility in the use of these patterns (see Section 3.4), including the availability of the complementing pattern with an explicit complementizer (pace Thompson and Mulac). Grammaticalization (as defined by Hopper 1991, e.g.) may be considered an advanced form of a more general phenomenon of 'structuralization': the integration of a semantic or functional domain

12. One may wonder why the non-qualificational use of these predicates is so variable in allowing a *that*-complement. After all, as mentioned above, even the mental state or process reading of these predicates involves a state of affairs. And on a naive interpretation, the function of a *that*-complement would precisely be to allow the expression of that state of affairs. One line of thought might be to assume a richer meaning for a *that*-complement than this naive one. Frajzyngier (1991, 1995) has argued that complementizers are independent markers of modality (in a wide sense), and that *that* in particular is essentially a marker of hypotheticality. This meaning would have been derived from the original usage of the complementizer in the context of verbs of saying, where it served, and still serves, to introduce a 'de dicto' domain: reported speech is obviously less certain than reality itself. Thus, according to Frajzyngier the difference between the non-qualificational direct perception reading and the qualificational indirect inference reading of a predicate such as *see* (see above) is due to the hypotheticality meaning of the complementizer (which is present in the latter but not in the former reading). In this view, it is not surprising that the qualificational mental state predicates allow omission of the complementizer, since it is redundant. Still, this cannot explain why non-qualificational *suppose* or *know* do, but non-qualificational *think* and to some extent *believe* do not favor a *that*-complement: e.g., what is 'known' can hardly be considered more hypothetical than what is 'thought' or 'believed'. (And I will later suggest a completely different explanation for complementizer omission in the qualificational uses of these predicates.) Clearly, there must be more going on, but investigating this is beyond my present concerns.

into linguistic form, starting with lexicalization and the development of a lexical predicate frame, and ending in complete fossilization. In that perspective, the qualificational reading of *think* and *believe* (and their Dutch and German equivalents) must in any case be considered to be in an early stage of structuralization, viz. as having been lexicalized.

With these properties of the mental state predicates in mind, let us now turn to the analysis of their qualificational uses. As suggested, in the corpus I will concentrate on the most prototypical among these predicates, viz. Dutch *denken* 'think' and German *glauben* 'believe'.[13] Given the variability among the members of this expression type, however, we should be careful when extrapolating from these specific forms to properties of the whole category, more so than with the adverbs and adjectives.

Table 3 shows the frequency of these predicates in their two readings (for the abbreviations, see Section 1.6). In view of the enormous number of instances, especially in spoken Dutch, I have only used part of the corpora

Table 3. *Frequency of* denken/glauben

		Dutch			German		
		EXP	SPK	TOT	EXP	SPK	TOT
Qualif.	n:	57	235	292	48	118	166
	0/0000:	1.95	25.65	7.60	1.72	9.88	4.17
	share:	33.7	67.0	56.2	69.6	88.1	81.8
Non-qualif.	n:	112	116	228	21	16	37
	0/0000:	3.83	12.66	5.93	0.75	1.34	0.93
	share:	66.3	33.0	43.8	30.4	11.9	18.2

13. As mentioned, German *denken* is hardly used qualificationally. A sample of 60,000 words of spoken and written data each reveals 31 spoken and 19 written cases, of which only 2, both spoken, are qualificational (i.e. 6.5% of the spoken cases, or 0.33 per 10,000 spoken words). Dutch *geloven*, however, is often used qualificationally, at least in spoken language, yet still considerably less than *denken* (cf. Table 3): the spoken VDB-corpus reveals 60 cases of which 41 are qualificational (i.e. 68.3%, or 4.47 per 10,000 words); the expository VDB-corpus shows 4 cases of which 1 is qualificational (i.e. 25%, or 0.19 per 10,000 words).

(in line with the remarks in Section 1.6). For spoken Dutch I have only used the VDB-corpus (91,623 words), for written Dutch I have used expository prose in the VDB-corpus and newspaper texts and popular scientific texts in the UDB-corpus (together 292,558 words). For spoken German I have used a random selection of transcripts from the DSK-corpus (119,443 words), for written German I have used the entire MK1-corpus (278,892 words).

For the non-qualificational reading it is difficult to compare the two languages: the radically different meaning of the predicates leads to a quite different range of usages, some of which are simply more often relevant in discourse than others. For example, the high frequency of Dutch non-qualificational *denken* in spoken language is to a considerable extent due to its very frequent use to introduce citations of own and others' past thoughts (cf. (83) above), a very common phenomenon in spoken conversations, and especially in narration.[14] Such a usage does not exist for German *glauben*.

The qualificational meaning is nearly equally frequent in Dutch and German expository prose, yet considerably more frequent in Dutch than in German spoken language. An explanation for this is far from obvious. One might conjecture that German qualificational *glauben*, even if the most prototypical of its type in German, is nevertheless less established than Dutch qualificational *denken*. But Section 3.4 will reveal arguments which are difficult to reconcile with such an assumption. Both languages share a trend for the qualificational use to occur much more often in spoken than in written language, however. Thus, the comparison of the frequencies (per 10,000

Table 4. *Frequencies (0/0000) of alternative epistemic expression types*

	Dutch			German		
	EXP	SPK	TOT	EXP	SPK	TOT
Adverb	1.89	2.58	2.22	1.06	3.64	1.81
Adjective	0.37	0.05	0.28	0.32	0.35	0.33
MS predicate	1.95	25.65	7.60	1.72	9.88	4.17

14. Not surprisingly, then, in literary prose (not further considered in this chapter), which is also to a considerable extent narrative, there is a very high frequency — 9.16 0/0000 — of non-qualificational *denken* as well (again to a considerable extent quotes).

words) of epistemic expression types in Table 4 shows comparable numbers of mental state predicates and adverbs in expository prose (in German the difference is somewhat larger but still relatively small), yet considerably more mental state predicates than adverbs in the spoken data (even if in Dutch the difference is much more radical than in German).[15] An explanation may be found in the evidential meaning of the mental state predicates, as I will argue in Section 3.2.

In the following sections, then, I will discuss the status of the Dutch and German mental state predicate in terms of the four factors introduced before, parallel to and in reliance on the analysis of the adverbs and adjectives in the previous chapter. Specifically, I will not only draw on corpus observations, but also on the special behavioral properties observed for the latter form types: since we have been able to establish a link between these properties and specific functional factors, the former can now be applied to help establish the status of the mental state predicates in terms of the latter.

3.2 Evidentiality

As indicated, the mental state predicates appear to be marked by the presence of an evidential meaning component besides the epistemic one. *Denken* and *glauben* also have one, and this dimension is undoubtedly the prime motivation for speakers to choose them from among the alternative epistemic expression types. Specifically, both predicates express subjectivity (in the sense of our definition in Section 1.4), i.e. they indicate that the speaker assumes strictly personal responsibility for the information provided.

Thus, these predicates typically occur in contexts in which the speaker voices personal views belonging in the realm of strictly individual experiences or attitudes or involving an opposition between the speaker and the hearer (i.e. antagonism). Examples are (87)–(89) (note the use of additional subjectivity markers such as *persoonlijk* or *persönlich* ‘personally’ in (88) and (89); cf. also *voor mij* ‘to me’ in (90) below).

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15. Since for the mental state predicates I only consider data from expository prose and spoken language, I have omitted the frequencies of the adverbs and adjectives in literary prose in Table 4. The global frequencies for these expressions have been recalculated correspondingly.

(87) Ik ging altijd slapen uit een zelfbeschermingsinstinct, denk ik, want als ik sliep kon ik ook niet bang zijn.
'I always went to sleep out of an instinct for self-protection, I think, because when I was asleep I could not be afraid.'

(88) A: je sprak in die onderhandelingen en op televisie ook altijd zo'n keurig, een afgemeten taaltje. heb je daar contact mee, met de arbeiders gehad? hebben zij dat aanvaard? of stel ik het verkeerd? B: wel, ik denk persoonlijk dat ik zeker uitstekende contacten heb gehad met de arbeiders.
'A: in those negotiations and on TV you always spoke such a neat, a measured language. did you have contact with the workers with it? did they accept it? or am I putting it the wrong way? B: well, I think personally that I have had excellent contacts with the workers.'

(89) A: ich persönlich bin im ganzen sehr skeptisch. so skeptisch wie ich in meinem leben noch nicht war. B: ja das hört man an sich bei ihnen nie so sehr raus. also ich hör ihre sendung schon lange. A: weil ich ja das positive im menschen kenne, und mag, und glaube daß man es hervorlocken kann und sollte.
'A: I personally am overall very skeptical. skeptical like never before in my life. B: as such one never gets this impression from you. I have been listening to your radio program for a long time. A: because I know the positive things in people, and like those things, and believe one can and should evoke them.'

The link with the personal domain is not only observable at the microlevel of single exchanges, it is also reflected at the macrolevel of discourse. The subjectivity of these predicates is no doubt the major explanation for their relatively very high frequency in spoken discourse (see Table 4). Conversation is characterized by spontaneity, it is normally much less planned than written discourse. Especially in open debates, interviews, etc., constituting the bulk of my spoken data, a speaker is frequently forced to produce opinions on the spot and to formulate immediate and unprepared reactions, which are therefore often tentative, impressionistic and personal. The subjectivity — as well as the epistemic vagueness (see Section 3.1) — of these predicates (as opposed to the adverbs and adjectives) are excellently suited to express this. In written language, on the other hand, there are no

immediate reactions, and a writer normally thinks more carefully about opinions voiced. This is especially applicable to the type of writing considered here, viz. newspaper articles, popular scientific works, etc., in which the author is usually supposed to report objectively, rather than to voice subjective views. In such circumstances, epistemic evaluations are less frequently required anyway. But if they are, a subjective and vague mental state predicate is probably less suited than an adverb or adjective.

Thus, in the written corpora there turn out to be very few real performative uses of these predicates (see Section 3.3 on performativity). The majority is purely descriptive, i.e. used to report on someone else's views or on views held in the past (45 Dutch and 27 German cases, i.e. 78.9% and 56.3% respectively). And of the remaining cases the majority occurs in renderings of spoken language, usually literal citations from interviews (10 Dutch and 14 German, i.e. another 17.5% and 29.2%). This leaves 2 Dutch and 7 German cases of real written performative uses, i.e. 0.07 and 0.25 per 10,000 words respectively. This is (especially in Dutch) even less than the number of adjectives. (In the spoken data the overwhelming majority of cases **is** performative.)

Within the spoken corpora there is considerable variation in the frequency of these predicates between individual interviews, however. To some extent this must be due to individual variation between speakers: some people simply use more epistemic expressions (mental state predicates, but also other form types) than others, due to differences in personality (assertiveness, e.g.), social status, etc. But to a considerable extent this is again related to the subjective nature of (the topic of) the conversation. It is very difficult to quantify this, because there are no hard criteria for classifying conversations in the relevant categories. But here are a few clear illustrations.

The most extreme example, showing the relevance of the nature of the topic, is provided by one Dutch TV-interview with 5 catholic clergymen/women on why they have taken their vows and how they think about their situation after years of service in the church. The interactions are full of strictly personal remarks about very subjective feelings. In this interview the number of qualificational occurrences of *denken* adds up to 46, i.e. 70.36 per 10,000 words (the spoken average was 25.65 — see Table 3 above). One typical example from this interview is (90).

(90) maar ik denk dat ook in het geloof up en downs zijn, want geloof heeft voor mij alles te zien met het leven en omgekeerd.
'but I think that also in believing there are ups and downs, because to me believing has everything to do with life and vice-versa.'

For a comparison, this interview contains 2 cases of the adverb *waarschijnlijk*, i.e. 3.06 per 10,000 words, and the adjective *waarschijnlijk* does not occur at all. Both perfectly correspond with the average for spoken language.

A less dramatic example from the German spoken corpus, stressing the role of antagonism, is a TV-debate in the aftermath of a large demonstration against a planned nuclear power plant. Discussants were leading politicians of majority and opposition parties, experts, and journalists who had covered the issue. The interaction is highly polemical, full of quarrels about personal interpretations of the facts and about assessments of how to proceed in handling the matter. In this debate, the number of qualificational cases of *glauben* amounts to 22, or 19.31 per 10,000 words, i.e. nearly double the average for spoken German. A typical example from this debate is (91).

(91) da widersprech ich jetzt ganz grundsätzlich. sie könnten noch tausend veranstaltungen machen mit denen die dagegen sind, sie würden kein jota daran ändern daß sie sagen bei uns nicht. ich glaube das müssen sie sehn.
'I contest this firmly. you can organize a thousand meetings with those who are against it, you would not change a thing to it that they say not in our backyard. I believe you must see that.'

On the other hand, there is only 1 adverbial *wahrscheinlich*, i.e. 0.87 per 10,000 words, and no adjectival *wahrscheinlich*, both clearly below the average for spoken language.

The fact that both in the Dutch and the German case all participants have a share in the use of the mental state predicate supports the assumption that its high frequency in these texts is not due to personal style, but to the actual topic and/or the nature of the interaction.

For Dutch *denken* the characterization of the evidential dimension in terms of subjectivity is exhaustive. For German *glauben*, however, the notion of subjectivity is often, yet not always sufficient. It is not, for example, in (92), preparing an interviewer's question (not included in the example) to a

former racing pilot, or in (93), from an examination about medieval literature and its historical context.

(92) eine pokalsammlung die sich wirklich sehen lassen kann. insgesamt haben sie glaube ich sechshundert in ihrem leben gewonnen.
'a collection of cups which is really worth showing. in total you have won I believe 600 in your life.'

(93) A: natürlich mußte er [the farmer] zuerst n bißchen vermögen zusammenhaben […] B: woher wissen sie denn das, daß das so war? A: gelesen im geschichtsbuch. B: ah aus m buch. in welchem. A: mensch und geschichte glaub ich.
'A: of course he first had to gather some wealth. B: how do you know that it was like that? A: read in a history book. B: ah from a book. which one. A: man and history I believe.'

In both cases the predicate indicates that the speaker is not fully certain about the information and can only take strictly personal responsibility for it. But in (92) it also indicates that the speaker assumes that the interviewee knows better (he surely can tell how many cups he has won) and can confirm or correct the information. Similarly, in (93) the predicate also indicates that the correct information (the exact title of the book) is available somewhere and can be checked by the hearer or may even be known to him. In general, then, the meaning of such uses of *glauben* can be characterized as: 'I am not certain, I think it is this, but the truth is available somewhere out there'.

A cursory look at Dutch *geloven* reveals exactly the same type of usage. This is illustrated by all 3 occurrences of it in (94), spoken by a show master as an introduction to an interview with a handicapped person. The different nature of these uses of *geloven* as compared to *denken* is underscored by the fact that replacing the former by the latter in (94) causes a totally different effect: the element of 'there are people here who can correct me if I am wrong' completely disappears.

(94) nu, Christopher Nolan krijgt op dit ogenblik de internationale aandacht, maar eigenlijk zijn er honderden die zoals hij 'n heel moedige strijd leveren om aanvaard te worden zoals ze zijn. Jocelyne Hansens bijvoorbeeld, ook getroffen door 'n beroerte, geloof 'k, of 'n hersenbloeding, kort na haar geboorte en sinds-

dien dus ook in grote mate verlamd, spastisch. maar ook zij probeert, geloof ’k, ’n heel zelfstandig leven te leiden. probeer ‘t maar te vertellen Jocelyne, want zij kan, geloof ’k, de letters spellen. ‘now, Christopher Nolan is currently getting international attention, but there are actually hundreds of people who like him fight very courageously to get accepted the way they are. Jocelyne Hansens, for example, also struck by a stroke, I believe, or a cerebral hemorrhage, shortly after birth and since then also to a large extent paralyzed, spastic. but she, too, tries, I believe, to lead a very independent life. just try to tell us Jocelyne, because she can, I believe, spell the letters.’

That qualificational *geloven* and *glauben* (and, intuitively, English *believe* as well) should have developed this specific evidential meaning is not surprising in view of the original non-qualificational meaning of these predicates (cf. Section 3.1): one can easily imagine how to get from ‘faithfully accepting information from someone’ to ‘not knowing for sure but certainty being available somewhere’. On the other hand, that *denken* (and English *think*, no doubt) should have developed a purely subjective meaning right away is not surprising either in view of its original non-qualificational meaning: after all, the mental activity of ‘reasoning with knowledge’ is completely internal to the subject’s mind. German *glauben*, then, has developed beyond this to a predominant use to express a purely subjective meaning, more or less like the meaning of Dutch *denken* and English *think*. *Glauben* has clearly gone much further in this than Dutch *geloven*: my corpus sample of the latter shows that it, too, has more or less purely subjective uses, but they are relatively much rarer than in German. It is difficult to quantify this, however, in view of the fuzziness of the transition to a purely subjective meaning.[16]

This difference between *glauben* and *geloven* may be explicable in terms of Traugott’s (1989 and elsewhere) hypothesis that in historical development evaluative meanings tend to become more subjective (even if Traugott’s and the present notion of subjectivity are not identical — see Section 1.4a). *Glauben*, the prime qualificational mental state predicate in German, has no

16. Some Dutch speakers (albeit a minority) use *geloven* instead of *denken* as the default qualificational mental state predicate (possibly due to dialectal background). The purely subjective cases of *geloven* in the data may be due to the speech of such speakers.

doubt gone further in establishing its qualificational meaning than *geloven*, only secondary to *denken* in Dutch. So a higher frequency of purely subjective uses of the former appears perfectly in accord with Traugott's claim. An alternative or complementary explanation may be found in the availability of *denken* as an expression with a purely subjective meaning in Dutch but not in German. No doubt, pure subjectivity is much more often needed in conversation than the quite complex evidential meaning of *glauben* or *geloven* involved in (92)–(94). Hence *glauben* may simply be used to fill up this 'niche' in German. The frequent need for a pure subjectifier in conversation may also partly explain why the 'naturally' subjective *denken* and *think* have become the prime qualificational mental state predicates in Dutch and English. But then, one may wonder why German should hardly have developed a qualificational meaning for *denken*.

As a final (trivial) argument in support of the subjective nature of these predicates, consider their behavior in terms of the only behavioral feature we have been able to relate to the dimension of evidentiality (cf. Section 2.2), viz. the way in which one can object to a speaker's epistemic qualification of a state of affairs. Clearly, it is impossible to use B to react to A in (95).

(95) A: I think/believe they have run out of fuel.
B: *Who says so?
B′: Do you, really?

The reason is, of course, that the use of the mental state predicate leaves no doubt about who is responsible for the epistemic evaluation.

In summary, among the epistemic expression types the mental state predicates (not only those analyzed here but in general) are primarily characterized by the presence of a strong evidential meaning component (which is different for each predicate). The adjectives also have such a component, but one difference is that this is clearly the major cause for using a mental state predicate, while this was not the case for the adjectives. Another difference is that the evidential dimension in the adjectival expressions is not due to the adjective as such, but rather to the nature of the syntactic construction in which it occurs. In the mental state predicates, however, the evidential element is clearly inherent in the predicate as such. This is obvious from the fact that in one and the same utterance the evidential value changes with the predicate used: cf., e.g., the list in (75)–(76) in

Section 3.1, or try to replace *geloven* by *denken* in (94). Thus, the evidential meaning must be part of the lexical semantics of the predicate.

3.3 Performativity

The mental state predicates are also a very common means for describing epistemic evaluations held by (or ascribed to — see below) someone else, or by (to) the speaker at some time in the past. As with the predicative adjectives, by changing the subject from 1st to 2nd or 3rd person, and/or by using past instead of present tense, the perspective can be changed from 'the speaker's here and now' (performative) to 'not the speaker's' or 'the speaker's but not here and now' (descriptive). Descriptive uses appear to be limited to the complementing forms, however. There are no descriptive parenthetical cases in the Dutch or the German data. And intuitively they seem impossible. Thus, in *they have run out of fuel, John thought* the predicate can only receive a non-qualificational reading, viz. the speaker 'literally' quotes what John was thinking (cf. (83) in Section 3.1). The same is true in *they have, John thought, run out of fuel*, if this construction is possible at all.

Descriptive uses of *denken* and *glauben* are quite frequent: in expository prose there are (as mentioned in the previous section) 45 and 27 cases (i.e. 78.9% and 56.3%) respectively, in spoken language there are 33 and 15 cases (i.e. 14.0% and 12.7%) respectively (excluding cases in reported speech environments, for the reasons discussed in Section 2.3). Examples are (96) to (99). In (96) the speaker is talking about the title of a radio program.

(96) 'k dacht eerst dat het levende dieren was, maar het is leve de dieren.
'I first thought that it was living animals, but it is long live the animals.'

(97) Veel mensen denken dat vogels zo automatisch op het verstoren van de veiligheid reageren, dat ze hun nest zonder meer in de steek laten als het eenmaal ontdekt en aangeraakt is. Maar zo eenvoudig is dat niet.
'Many people think that birds react so automatically to a disturbance of security, that they abandon their nest without further ado once it has been discovered and touched. But it is not as simple as that.'

(98) Der Finder, Herr Abbe Bourgeois, glaubt Spuren menschlicher Bearbeitung an diesem Stück [a piece of flint from the lower Miocene] gefunden zu haben, welche Annahme allerdings stark bestritten wird.
'The finder, mister Abbe Bourgeois, believes to have found traces of human manipulation on this piece, an assumption which is heavily contested though.'

(99) So habe sich jetzt herausgestellt, daß der Erregertyp 'El tor' des Cholera-Vibrionen nicht so harmlos sei, wie man bisher geglaubt hatte.
'Thus it would now be apparent that the causative agent 'El tor' of the Cholera vibrion is not as harmless as was believed so far.'

One may wonder whether cases such as (97) or (99) can still be called descriptive qualificational uses at all: it is unlikely that the scientists implied in (99) and especially the people mentioned in (97) have ever expressed or even consciously made the epistemic evaluation 'I think/believe that …'. Yet Urmson (1952: 488–489) has adequately characterized this type of descriptive usage of the mental state predicates:

> Smith, who has discovered that there has been a sudden railway stoppage, sees Jones making his habitual morning dash to the station, and says 'Jones believes that the trains are working'. […] Jones, who has probably not considered the matter at all, is behaving in the way that someone who was prepared to say either 'The trains are running' or 'I believe that the trains are running' would behave […]. We thus […] extend our use of the verb 'to believe' to those situations in which a person behaves as a person who has considered the evidence and was willing to say 'I believe' would consistently behave.

Similarly, in (97) and (99) the speaker/writer most probably ascribes rather than describes an (in retrospect) tentative assumption to an (in these cases) indefinite group of people, irrespective of the question whether they have actively considered the possibilities and expressed their conclusions or not.

Urmson considers such ascriptive cases to be derivative from truly qualificational uses. Yet they are not fundamentally different from 'standard' descriptive cases such as (96) or (98). Although a truly reporting reading is more likely in the latter, they do not warrant either that the subject has ever

uttered or even made an epistemic evaluation of the state of affairs. And these are no exceptions: many or even most descriptive cases are unclear as to whether they are ascriptive or reporting. And in most contexts this is unimportant (this also applies to descriptive adjectives). We are inclined to interpret cases such as (97) or (99) as ascriptions because it is unlikely that the speaker has heard the people or the scientists say that they think so and so. But that is a contextual matter, not an inherent semantic feature. Ascriptive cases can thus be considered an integral and nearly indistinguishable subcategory of descriptive epistemic expressions. And they are nothing exceptional: all types of speech or thought reports, even 'direct' ones, are colored or even creatively invented by the reporter (i.e. ascribed), usually in undiscoverable ways (cf. Chafe 1994: 215ff).

A typical property of the descriptive mental state predicates is that they suggest that the present speaker considers the evaluation by the subject of the predicate questionable or even wrong. For Dutch *denken* this applies in the overwhelming majority of cases, for German *glauben* in at least half of the cases. (Urmson's analysis of *believe* also involves this feature: it is no accident that he analyzes *Jones believes that the trains are working* from the perspective that this is a wrong assumption.) Thus, the expression with the mental state predicate is very often accompanied by an explicit statement that the position involved is questionable and/or by a formulation of an alternative position (this is true for all examples given above). But even when this is not the case, the mental state predicate (especially *denken*) tends to communicate skepticism on behalf of the speaker. Thus, even in B's 'neutral' question in (100) it is hard to avoid the understanding that he considers the assumption at least questionable. And also the use of *denken* by A is unmistakably of this kind. Likewise, it is not surprising that these predicates regularly occur in rhetorical questions with a negative tendency, as in (101).

(100) A: je hoort de laatste tijd veel dat deze beesten worden afgeslacht, alleen voor de neus, […] voor er potentietabletten van te maken. B: denkt u dat dat helpt? A: ik weet 't niet, maar […] ik heb 'n verloofde […] en misschien denkt die het wel, misschien blijft ze daarvoor bij mij, want ik heb dus nu 'n neushoorn.
'A: these days one often hears that these animals are killed, only for the nose, to make potency pills out of them! B: do you think

that helps? A: I don’t know, but I have a fiancee and maybe she thinks it does, maybe that’s why she stays with me, since I own a rhinoceros now.’

(101) “Frühzeitig genug habe ich mein Mädel aufgeklärt”, wimmerte sie. “Ich habe ihr von Blumen und Bienen, vom Fruchtknoten und Blütenstaub und alldem erzählt […]”. “Von Blumen und Blütenstaub?” fragte ich. “Glauben Sie, daß das eine Brücke ist zur Wirklichkeit des Lebens und zu den robusten Forderungen der etwas weniger poetischen jungen Männer?”
‘“Early enough I educated my girl”, she lamented. “I told her about flowers and bees, about the stigma and the pollen and everything”. “About flowers and pollen?” I asked. “Do you believe that is a bridge to the reality of life and to the robust demands of the somewhat less poetic young men?”’

This element of skepticism is no doubt due to the subjective meaning of these predicates. Even when used descriptively, they imply that the subject’s evaluation of the state of affairs was his/her strictly personal responsibility, not a generally accepted position. The implicature that this subject may actually (have) be(en) wrong in assuming this is imminent. This is thus similar (but with the opposite effect, of course) to what we have observed for the descriptive uses of the intersubjective variant of the adjectival structure. But it is different from descriptive subjective variants of the latter: as mentioned in Section 2.3, in an example such as (35): *he considers it probable that* … there seems to be no suggestion whatsoever regarding the speaker’s opinion. Why this type of expression should not generate a skeptical effect is not obvious. Maybe it is a result of the fact that subjectivity is part of the lexical meaning of the mental state predicates, but not of the adjectives.

The above analysis suggests that the skeptical effect is limited to mental state predicates in which subjectivity is predominant as an evidential meaning. Maybe *think* and *believe* even exhaust the list. In fact, it seems questionable whether descriptive uses of, e.g., *guess* or *suppose* (or even *doubt*) also trigger it (if they are really used descriptively at all: intuitively, this would seem rare). The fact that German *glauben* is less frequently skeptical than Dutch *denken* accords with the observation that the former also occurs with a more complex evidential meaning. In a descriptive

context, this meaning may be less suited to suggest disagreement than the always purely subjective *denken*. In this logic we should expect that also Dutch *geloven* is less inclined to suggest skepticism. The sample of corpus cases I have considered (42 cases — see above) does not offer an answer because there is not a single descriptive case in it. Unless that fact as such is significant, of course.

Past tense forms do not automatically lead to descriptivity, at least not for Dutch *denken* (and English *think*). Consider (102).

(102) A: hoe verklaart u dat de CVP wel met de socialisten wil praten op 't nationale nivo maar niet op 't regionale nivo? […] B: ik dacht dat ik twee redenen gegeven heb. ten eerste […].
'A: how do you explain that the Christian Democrat Party is willing to talk with the socialists at the national level but not at the regional level? B: I thought I have given two reasons. firstly …'

B's response does not express a past assumption (in which case one would have expected a past and not a present perfect in the embedded clause). Rather, it expresses his current view, performatively. The past marker does not express temporality here, but contributes to the expression of the epistemic/evidential qualification as such. In particular, using the meaning of pastness metaphorically (Fleischman 1989), it weakens the evaluation: a present tense would have sounded stronger. This case is, thus, reminiscent of the past tense form of the modal adjective in example (26) in Section 2.3, except that in the latter the past tense did not contribute to the epistemic expression as such, but was used to indicate irreality. A weakening use of the past does not seem possible with the adjectives (it is present in the 'past tense' modal auxiliaries in English, however — see Bybee 1995). Maybe this is due to the purely formal circumstance that, unlike with the mental state predicates (and auxiliaries), the past tense is not marked on the adjective itself, but on the copula.

This 'performative past' of *denken* is rare in the written data, but constitutes the majority — 60% — of past tense cases of the predicate in the spoken subcorpus. In the parenthetical uses of *denken*, past tense seems only interpretable this way. This corresponds to the intuition that parentheticals cannot be used descriptively.

A similar performative reading seems marginally possible with *denken* or *think* in the progressive, as in (103) (I have no corpus cases of this, though).

(103) I am/was thinking that they might have run out of fuel

One would expect the progressive to be limited to the non-qualificational reading of *think*, for obvious semantic reasons. The progressive marks an ongoing activity. This is compatible with the non-qualificational reading: reasoning with knowledge can be currently going on (cf. (80) above). The qualificational reading, however, presents a momentaneous state of mind, hence a progressive should not be possible. This is of course true for all similar predicates when used qualificationally, so Urmson's (1952) observation that none of them has a progressive form is in the line of expectation. Yet, intuitively, (103) can be qualificational. In fact, note that (103) is difficult without an epistemic expression or with a stronger epistemic expression in the embedded clause: cf. (104).

(104) a. ??I am thinking that they have run out of fuel
b. I am thinking that they have ??probably/*certainly run out of fuel

It is unclear why this should be so if the mental state predicate were non-qualificational and the progressive a marker of progressive aspect. But it does make sense if the predicate is qualificational and the progressive an epistemic weakener ('progression' metaphorically standing for 'uncertain with a tendency towards the positive'). Because of the very special use of this form, it apparently must be accompanied by an epistemic expression in the embedded clause, but obviously a harmonic one. In this form the mental state predicate can, however, not be used parenthetically, nor occur without the complementizer. These are probably effects of the high markedness of this use.

An epistemic use of the past (or the progressive) does not seem possible with German *glauben* or Dutch *geloven* or English *believe* or any other mental state predicate in any of these languages, however. Past tense unavoidably makes these predicates descriptive. Why this phenomenon should be limited to *denken* and *think* is not obvious. One could interpret this in terms of degrees of grammaticalization or structuralization (cf. Section 3.1). Maybe such 'deviant' uses of grammatical markers are correlated

with some amount of structural establishment of the host form. As mentioned, *denken* and *think* have no doubt gone further in this than any other mental state predicate in Dutch or English. This explanation is in line with the fact that by far most epistemic uses of the past of *denken* in the corpus are parenthetical, which is no doubt a more strongly grammaticalized form than the complementing one. The problem with this analysis is that it implies that also German *glauben* is less structuralized than Dutch and English *denken* and *think*. But this is contradicted by other observations to be discussed in Section 3.4 below.

Finally, let me point out that the three behavioral features relating to the possibility for a descriptive use discussed in Section 2.3 are also applicable here.

a. *Questioning*

Complementing mental state predicates can be questioned, as we have seen above (cf. (100)–(101)), and as should be the case when a form can be used descriptively. If parentheticals cannot be descriptive, however, we should expect that they cannot be questioned. This is seemingly contradicted since they do occur in questions, albeit rarely. There is only one corpus case, viz. Dutch spoken (105). Such a use is perfectly feasible in German as well though (and see Section 3.4g for a semiparenthetical case from the German corpus). And English allows it too: the translation of (105) may not be ideal, but see Thompson and Mulac (1991) for corpus cases.

(105) waar is het land waar jij behoort, denk je?
‘where is the country where you belong, you think?’

Such uses of a parenthetical seem limited to Dutch *denken*, English *think* and German *glauben* (i.e., again, to the most developed among the mental state predicates): it is much more difficult if not downright impossible to do the same with any other qualificational mental state predicate in these languages, as can be seen in (106).

(106) Waarom zijn ze zonder benzine gevallen $^{?}$geloof/$^{??}$vermoed/$^{??}$schat je?
Warum ist ihnen der Sprit ausgegangen, *nimmst du an/$^{?}$meinst/*vermutetst du?
Why have they run out of fuel you $^{?}$believe/$^{??}$guess/$^{??}$suppose?

Cases such as (105) are perfectly parallel to the use of adverbs in questions (cf. Section 2.1), however. First, it is not the mental state predicate which is being questioned, but the main clause (unlike in complementing cases such as (100) and (101)). Second, the parenthetical does not describe or ascribe an epistemic evaluation by or to the listener, nor does it put forward a hypothetical evaluation of the state of affairs (again unlike cases such as (100)–(101)). Rather, it serves as a speech act modifier: it turns a neutral question into a tendentious one. In (105) the effect is mild: it only indicates that the questioner is uncertain whether the hearer can say anything sensible about the matter at all.[17] But usually, clause-final parentheticals in questions have a more aggressive effect: they typically cause a rhetorical reading with a reproaching undertone, of the type 'don't tell me you don't know'. Thus, even in a contextless and neutral question such as (107), it is nearly unavoidable to understand the parenthetical as meaning 'come on, don't be so naive'.

(107) Why have they run out of fuel you think?

So these uses are not descriptive at all. On the contrary, through such uses the speaker performs another kind of question as compared to when the parenthetical is absent, so the form is actually used performatively (quite like adverbs in questions). Moreover, these uses do not have an epistemic meaning anymore, even if the present meaning is no doubt derived from the epistemic/evidential meaning (a process which is apparently limited to the most established among the qualificational mental state predicates). Thus, their reproaching undertone — comparable to the 'skeptical meaning' of the descriptive uses — is no doubt again based on the subjectivity of the epistemic uses of these predicates.

b. *Conditionals*

In line with expectations, the complementing form can, but the parenthetical form cannot occur in the protasis of a conditional to describe a hypothetical qualification (like in questions). This can be seen in (108) and (109).

(108) If you think they have run out of fuel, I'll send a tanker after them

17. The parenthetical in (105) was only added after a short pause by the speaker, as if he first had to detect some hesitation to answer the question on the part of the interlocutor. So it was probably not planned in advance, which may help explain its mild effect here.

(109) *If they have run out of fuel you think, I'll send a tanker after them

Note, by the way, that (108) again tends to imply that 'I rather think they have not run out of fuel', or at least that 'I don't know whether they have and cannot really judge it, but I am doubtful', i.e. the skeptical element.

c. *Causality*
Trivially, the mental state predicates allow to distinguish between two different readings of a causative clause, relating the cause to the main clause subject or to the speaker: they unavoidably mark their subject, thus disambiguating the reference. The speaker-oriented reading, then, can be rendered with a parenthetical, as in (110),[18] while the subject-oriented reading requires a complementing form of the predicate, as in (111).

(110) Peter trinkt noch einen Schnaps, weil er, glaube ich, süchtig ist
'Peter drinks another schnaps, because he is addicted I believe'

(111) Peter trinkt noch einen Schnaps, weil er glaubt, daß er süchtig ist
'Peter drinks another schnaps, because he believes he is addicted'

To summarize this section, descriptivity appears to be another quite important factor causing the use of the mental state predicates (again much more important than for the modal adjectives), especially in written language. In general, this factor is clearly next in line after the factor of evidentiality, but the two probably often line up in the sense that a speaker's use of this expression type is simultaneously triggered by the availability of a descriptive use and the skeptical reading which comes along with it.

3.4 Information structure

Also in terms of information structure one might expect a difference between the complementing and parenthetical mental state predicates, comparable to that between the adjectives and adverbs. Parentheticals are defined (see Section 3.1) as insulated structures lacking grammatical

18. Using a complementing pattern instead of a parenthetical in (110) would trigger yet another meaning, not discussed in Section 2.3, viz. that Peter drinks another schnaps because the speaker believes he is addicted. But this issue is immaterial for the present discussion.

integration in the utterance. They are 'excursions mentioned in passing'. It is unlikely that such structures are used to express the most important information in the utterance. Hence, one expects them to defy focus, probably as radically as the adverbs. The complementing forms, however, are syntactically comparable to the predicative adjectives:[19] in both the epistemic expression occurs as the main clause predicate and the state of affairs appears in a complement clause. Like the adjectives, then, one would expect them to be used systematically under conditions of focality.

The facts turn out to be different, though. They do sustain the assumption regarding the parentheticals, but not regarding the complementing forms. In the corpus, there are 4 written and 47 spoken cases of parenthetical *denken* and 1 written and 37 spoken cases of parenthetical *glauben*, i.e. in total 17.5% and 22.9% of the Dutch and German cases respectively.[20] (Their predominance in spoken language is at least partly due to the fact that they are exclusively performative, while performative mental state predicates are rare in the written data. Cf. Section 3.3.) As the discussion below will show, these forms are without exception non-focal. Among the complementing corpus cases, however, there are instances of focal uses, but they are very rare, and non-focal cases behave like the parentheticals in many respects. Also the special behavioral properties related to information structure in Section 2.4, when applied here (see below), show that the parentheticals fundamentally disallow focus, while the complementing forms in principle do allow focus, yet by far not as 'enthusiastically' as the adjectives. Moreover, the German (but not the English) complementizerless complementing forms in particular turn out to have a special position, in that they behave entirely as parenthetical forms.

For most criteria in the following overview, the relation to information structure has been discussed in connection with the adverbs and adjectives

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19. 7 Dutch and 10 German cases involve an infinitival complement instead of a *that*-complement, as in *he thinks to have won* (difficult in English but fine in Dutch and German). This may be considered a reduced variant of the pattern with a *that*-complement, though, which is preferred when there is referential identity between the main and embedded clause subjects. See also Noël (1997), who shows that contextual factors such as recency of the referent rather than semantic factors determine the choice for either complement in English *believe*.

20. For Dutch *geloven* the share of parenthetical forms is much higher: the sample mentioned above contains 19 instances, i.e. 45.2%. Why this is so is unclear to me.

(see Section 2.4 for details). Unlike there, for ease of presentation I will not strictly separate between corpus observations and special behavioral properties anymore. Some of the observations below may seem minor in terms of the numbers of cases involved, but the crux is the global picture emerging from all of them together.

a. *Negation*

The parentheticals in the corpora never contain negation, and negative parentheticals even appear impossible. Thus, (112a) cannot be used to express a negative polar epistemic evaluation of the state of affairs, nor to negate the epistemic/evidential qualification as such (i.e. to express the meaning 'it is not the case that I think that …').[21] Parentheticals cannot even contain the negative mental state predicate *doubt* (or *betwijfelen* and *bezweifeln* in Dutch and German): cf. (112b).

(112) a. *It is dangerous, I don't/do not think, to run out of fuel in the desert
b. *It is dangerous, I doubt, to run out of fuel in the desert

In line with the discussion regarding the non-existence of negative modal adverbs and the inability of the modal adverbs to be negated (cf. Sections 2.4l-m) this is a clear sign for the fact that parentheticals do not allow focus, quite like the adverbs.

Parentheticals can participate in expressing a negative polar qualification, however, if the negation occurs in the clause they qualify. This is fairly rare though: there are 5 Dutch and 6 German cases, i.e. respectively 9.8% and 15.8% of all parentheticals. This is comparable to the number of equivalent cases with adverbs. And also the nature of the cases is similar (cf. Section 2.4e). In all of them the negative polar element as such, without the scalar dimension, explicitly contrasts with the previous context. Examples are (113), a response to the question whether catholic priests should be allowed to marry, and (114), from a political debate regarding a nuclear power plant,

21. Some English speakers appear to accept a negative parenthetical in the context of a negative main clause (but only there), as in *it is not dangerous, I don't think, to run out of fuel in the desert*. In such a case, the parenthetical merely echoes the negation in the main clause, hence it is not a counterexample to our present point either: the parenthetical is not in focus. Such cases are entirely out of the question in Dutch and German, however.

in which the speaker criticizes a political official. Note that in both the negative expression combines with an aspectual or temporal dimension which participates in the contrast, as in similar adverbial cases. This occurs in 4 Dutch and 2 German cases. In (114) this element is more indirect than in (113), viz. added in a 'clarifying' clause following the clause with the parenthetical and the negation. Also note the heavy stress on the negative element in (114).

(113) het is momenteel, denk ik, echt nog niet mogelijk en misschien komt het wel, laat ons hopen hé, maar ik denk dat op dit moment […] er veel belangrijker dingen zijn […].
'it is at the moment, I think, really not possible yet and maybe it will come, let us hope, but I think that for the moment there are much more important matters'

(114) diese landesregierung hat glaub ich eben ni:cht den versuch unternommen jedenfalls nicht in diesem umfang wie notwendig herr späth die leute davon zu überzeugen warum das so sein müsse und daß die oder jene besorgnis auf grund der un jener gutachten nicht begründet sei.
'this government has I believe no:t tried at least not to the necessary extent mister späth to convince the people why this should be so and that this or that fear on the basis of this and that report would be unfounded.'

The complementing pattern is (like the adjectives) not subject to any restrictions of the type in (112) (at least not generally: see below on the complementizerless forms in German). Moreover, the frequency of cases involving a negative polar epistemic evaluation is higher than for the parentheticals: 40 in Dutch and 31 in German, i.e. respectively 16.6% and 24.2% of all complementing forms (of all types, including reduced or elliptical variants).[22] In German this is comparable to the share of negatives

22. These findings (including those for the parentheticals) clearly run counter to Tottie's (1983) observation that mental state verbs in English show a high tendency (68% in written, 53% in spoken corpus data) to draw negation. On the other hand, the experimental data to be reported in Chapter 5 are more in line with Tottie's observation. In the present case, the difference between the corpus findings and the experimental data is obviously due to the special nature of the experimental conditions. So the question is to what extent Tottie's findings

among the adjectives (26.7%), but in Dutch it is radically less (48% for the adjectives). Upon closer consideration, however, there is a difference with the adjectives even in German. The reduced cases will be discussed in (b) below, the following only concerns the full complementing forms.[23]

– There were no instances with negation in the embedded clause among the adjectives, but here they are the majority: 22 Dutch and 18 German ones, i.e. 55.0% and 58.1% of the negative cases respectively. Their situation is unexceptionably as in the parenthetical cases: in all instances the negative element contrasts (usually explicitly) with a positive assumption in the discourse context, but the scalar dimension expressed by the predicate does not participate in this contrast. In 4 Dutch and 1 German cases, the polar contrast is even explicitly contained within the embedded clause, as in (115). Moreover, there are again several cases (9 German and 7 Dutch) in which the negative expression is accompanied by a temporal or aspectual element which participates in the contrast, as in (116).

(115) Denton denkt dat dit inderdaad de gaten tussen relatief dicht bij elkaar liggende soorten verklaart, maar niet de grotere kloven zoals die tussen bijvoorbeeld molluscen (weekdieren) en anthropoden (kreeftachtigen) bestaan.
‘Denton thinks that this does indeed explain the gaps between relatively close species, but not the wider gaps like the one between for example mollusks and homarids.’

(116) ich muss auch sagen ich kann mich nich erinnern dass ich wild auf diese bücher war das heißt doch ich glaube beinahe bei uns gabs die noch nicht.
‘I must also say I cannot remember that I was wild about these books that means yes I almost believe with us [i.e.: in those days] they did not exist yet.’

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are not also due to accidental special characteristics of his corpus selection.

23. Apart from these, there is one Dutch negative case in a ‘reduced’ question, viz. *je denkt het niet?* ‘you don’t think so?’, which echoes an identical statement by the interlocutor, and is thus fully in line with the observations about the reduced cases to be discussed in (b).

Dutch has even developed a special pattern in which the complement is constituted by a negative or positive polar element only, viz. (117).

(117) Ik denk van niet/wel
'I think not/yes'

This pattern resembles the reduced cases in (b) below, and especially (121b). But the difference is that *van* (normally a preposition) in (117) is not a deictic element referring to a state of affairs (unlike *dat/het* in (121b)), hence it must be a complementizer (though this is not normally its function; but one cannot use the complementizer *that* here).[24] There are 3 corpus cases, all positive polar, and all in response to a *yes/no*-question, i.e. a situation in which the polar dimension alone is explicitly contrastive.

– Even the complementing cases with negation in the main clause — 13 Dutch and 5 German (on the low frequency of the latter, see below) — are unlike the adjectives, however.[25] Possibly with a few exceptions (discussed in (c) below), it is again the polar element alone which contrasts with the surrounding discourse. The mental state predicate does not participate in this contrast and has no special informational status at all (neither in Dutch nor in German). Thus, in (118), from a discussion about why there should be suffering in view of the presumed goodness of God (the relevant case is in the last sentence), there is a polar contrast between A's and B's expressions, but the predicate itself (quite like the one at the start of B's reaction) is obviously not focal.

(118) A: maar men verwacht altijd dat hij dus […] een god van goedheid is, hé! […] B: ik denk dat het al te gemakkelijk is om die waarom-vraag, waardat uiteindelijk je als mens nooit uitkomt, iemand die, als je met mensen spreekt die met het lijden geconfronteerd worden, ja, dan moet u eigenlijk geen uitleg aan geven, hé! ik denk ook niet dat je dat naar god moogt toeschuiven, zo.
'A: but one always expects that he is a god of goodness, right!

24. French has a comparable pattern with an obvious complementizer: *je pense que oui/non*.

25. There is also the negative mental state predicate *betwijfelen*, *bezweifeln* 'doubt', of course, which may be compared to the negative-incorporated adjectives, but which is not covered by the present corpus analysis. A quick count in the same corpus as used for *denken* and *glauben* reveals only 3 Dutch and 8 German qualificational cases of this predicate, however.

B: I think it is too easy to [main verb not expressed] that why-question, which ultimately as a human being you never solve, someone who, if you talk to people who are confronted with suffering, yes, then you shouldn't really give an explanation for it! I also do not think that you can relegate this to god like that.'

What is the difference between main and embedded clause negation, then? In most corpus cases they seem mutually interchangeable, but in a few (especially main clause negative ones), replacing one by the other is intuitively not possible or not equal in effect. Apparently, this has to do with the relative informational status of the negation and the state of affairs. Unlike in the embedded clause negative cases, in main clause negative cases the information about the state of affairs tends to be equally or even more important than the negation, despite the latter's contrastivity.[26] Thus, in many of these cases, including (118), the (as such contrastive) negation was already contained in one or more preceding utterances by the same speaker. It is thus maintained across a number of consecutive utterances, hence it loses some of its salience relative to the information about the state of affairs, which is further developed across those utterances. In a few other main clause negative cases the information about the state of affairs has high intrinsic value. Thus, in (119) the upcoming war, the thematic center of the message, has high sensational value (the text is from the 'Bildzeitung') and is thus the core concept for the rhetorical tension built up in the rest of the paragraph.

(119) "Der Finger liegt am Abzug! Ich glaube nicht, daß der Krieg noch zu vermeiden ist!" Das kabelte uns am vergangenen Mittwoch unser nach Israel entsandter Chefreporter Günter Stiller aus Tel Aviv. Am Samstag drahtete er: "ein Volk, dem seine Todfeinde die Vernichtung garantiert haben, das sich von den Weltmächten verraten und verkauft fühlt, diesem Volk sollte man keine übermenschliche Geduld mehr zutrauen und zumuten." Am Montagmorgen um 7 Uhr brach der Krieg im Nahen Osten aus. ' "The finger is on the trigger! I don't believe that the war can

26. The relation between main and embedded clause negative variants here is thus clearly different from that in the adjectives (see Section 2.4a). So the phenomenon traditionally called 'negative raising' (see Nuyts 1990a, 1992b) is less uniform than has sometimes been assumed (including by myself in the references mentioned).

still be avoided!" This our chief reporter Günther Stiller, sent to Israel, cabled us from Tel Aviv last Wednesday. On Saturday he telegraphed: "a people which its mortal enemies have guaranteed destruction, which feels betrayed and sold by the world powers, from this people one should no longer expect superhuman patience." On Monday morning at 7 o'clock the war in the Middle East broke out.'

The informational status of the mental state predicate (i.e. the scalar and evidential dimension of the qualification expressed) is of little import in all of this.

The low frequency of main clause negation in German is actually due to the absence of such cases in the complementizerless forms. These forms even appear not to allow main clause negation at all: cf. (120a). And they do not accept the negative predicate *bezweifeln* 'doubt' either: cf. (120b). Thus, they behave exactly as the parentheticals.

(120) a. *Ich glaube nicht, es ist gefährlich, wenn einem in der Wüste der Sprit ausgeht
b. *Ich bezweifle, es ist gefährlich, wenn einem in der Wüste der Sprit ausgeht

b. *Reduced forms*

The parentheticals do not have 'absolutive' uses comparable to those of the adverbs (it is hard to imagine what they should be like). The complementing mental state predicates, however, like the adjectives, are sometimes used in a 'reduced' pattern, lacking a complement representing the qualified state of affairs but containing a deictic element referring to it instead.[27] Like the reduced adjectives (cf. Section 2.4b) and the absolutive adverbs (cf. Section 2.4f), this form occurs as an addition to a preceding utterance mentioning the state of affairs. It is relatively much less frequent than the reduced adjectives, but more frequent than the absolutive adverbs: there are 16 Dutch and 13 German cases, i.e. 6.6% and 10.2% of all complementing mental state predicates (for the adjectives this was 28% in Dutch and 26.7% in German, for the adverbs 1.6% in Dutch and 2.5% in German).

27. There are also several questions with a reduced pattern in the data, i.e. of the type *what do you think?*, but I am not concerned with those here. On questions, see (g) below.

There are a few variants of this reduced pattern (quite different from the possibilities in English). The most important ones are presented in (121).

(121) a. (Dat) denk ik (niet/wel)
(Das) glaube ich (nicht/schon)
'I (don't/surely) think/believe so'
b. Ik denk het/dat (niet/wel)
Ich glaube (das) nicht/schon
'I (don't/surely) think/believe so'
c. Was ich nicht glaube
Wat ik niet denk
'Which I don't think/believe'

(121a) can occur with or without a positive or negative polar marker, (121b) requires a polar marker in German, but not in Dutch, and (121c) seems only possible with a negative marker. In the data (121a) occurs 8 times in Dutch (1 negative, 2 positive, 5 without polar marker) and 8 times in German (4 negative, 2 positive, 2 without polar marker). This form is sometimes used to answer a question (2 German, 1 Dutch), but mostly serves as a reaction to a statement by the interlocutor. (121b) occurs 8 times in Dutch (3 negative, 4 positive, 1 without polar marker) and 3 times in German (2 negative, 1 positive). All instances respond to a *yes/no*-question. There are 2 German cases of (121c), both metaremarks to a statement by the speaker him/herself (this type is probably limited to such uses). There are no Dutch cases of this pattern.[28]

In terms of information structure, then, these cases are, with only 2 exceptions, comparable to the absolutive adverbs, rather than to the reduced adjectives.

– In the cases with an explicit positive or negative polar marker it is again usually this polar marker and not the predicate which is central in the discourse context (or is at least presented as such by the speaker: cf. the discussion regarding the absolutive adverbs in Section 2.4f). The large

28. One Dutch case stands somewhat apart, viz. *al wordt dat door de buitenwereld wel eens gedacht* 'even though this is sometimes thought by outsiders'. It is closest to (121a), but then used as a metaremark to the speaker's own statement. I have nevertheless included it in category (121a).

number of cases with an explicit positive polar expression is symptomatic for this: as argued, the presence of such a marker despite the positive polarity of the epistemic expression (the predicate) itself is a clear sign for the special prominence of the polar dimension independently of the scalar dimension of the evaluation.[29] Here are a few examples: in (122) B is explicitly offered the choice between 'yes' or 'no'; in (123) B reacts to the negative assumption raised in the question; in (124) the real answer is simply *ja* 'yes'; and in (125) (from a discussion about whether the expression *selig sein* 'to be blissful' is obsolete) the first instance is in disagreement but the second one in agreement with the interlocutor, thus creating a polar contrast between the two in which the predicate obviously does not participate (the English translation does not optimally reveal the parallelism of the two instances).

(122) A: […] heb jij nog iets geleerd of afgeleerd 't afgelopen jaar of niet? B: ik dacht 't niet.
'A: have you learned or unlearned something last year, or not? B: I don't think so.'

(123) A: d'er zijn natuurlijk die voorstellen tot krachtlijnen van 'n regeerbeleid, die […] u aan de pers heeft voorgesteld. 't is wel 'n beetje raar dat u ermee voor de dag komt terwijl u niet eens de kans heeft gehad om aan de betrokken partijen dat document voor te leggen. hebt u 't nu niet een beetje verbrand? is't nu nog bruikbaar voor uw opvolger? B: ik denk dat wel.
'A: there are of course those proposals for the main guidelines for a government policy, which you have introduced to the press. it is somewhat strange that you bring this into the open while you have not even had the chance to present this document to the parties involved. haven't you spoiled it a little bit? is it still useful for your successor now? B: I think it is.'

29. Thus, it is even impossible to use a separate positive polar marker in the reduced adjective construction: in *dat is **wel** waarschijnlijk* or *das ist **schon** wahrscheinlich* 'that **is** probable' the polar marker can only be taken to have the adjective in its scope — e.g., as a denial of a denial that the state of affairs is probable — but not to combine with the adjective in expressing a positive polar epistemic evaluation of the state of affairs.

(124) Bild: ist in diesem Jahr noch eine Leistungssteigerung drin? Uta: bei idealen Wettkampfbedingungen glaube ich — ja.
'Bild: is an improvement of your performance still feasible this year? Uta: in ideal competitive circumstances I believe — yes.'

(125) A: da können erstens regionale unterschiede sein. B: nein glaube ich nicht. A: und dann schon generationsunterschiede […] das geht jetzt sehr schnell in letzter zeit. B: glaube ich auch ja ja ja ja. A: daß die generationen dann immer kürzer werden.
'A: there can firstly be regional differences. B: no I don't believe [so]. A: and then already generational differences, this now goes very fast recently. B: [that] I believe too yes yes yes yes. A: that generations get shorter all the time.'

There is only 1 clear (German) exception in which the predicate **is** focal, viz. a case involving explicit contrast, to be discussed in (c) below (example (131)).

– Also in the reduced cases without a separate polar marker the mental state predicate is mostly non-focal. All Dutch instances except 1 are used in circumstances in which the epistemic/evidential evaluation supports or only slightly modifies an earlier statement, without involving contrast. These are thus perfectly comparable to similar absolutive uses of the adverbs, of the type illustrated in (60) in Section 2.4f. One example is (126), in which A reconfirms and only mildly relativizes his own earlier statement in view of B's request for reassurance.

(126) A: maar ne keer dat we in de vergaderingen, in de discussies waren, en ook wanneer we spraken, dus familiaal, was het altijd meneer Pullinckx. het is nooit Raymond geweest. en hij heeft me dat altijd verweten. B: ja? A: ja, ik denk het.
'A: but once we were in meetings, in discussions, and also when we were talking, familiarly, it was always mister Pullinckx. it has never been Raymond. and he has always reproached me for this. B: yes? A: yes, I think so.'

The two German cases without polar marking are different in type, but not in principle. In (127) (the other case is identical), focus is on the

identity of the one who has expressed the quoted opinion, not on the mental state predicate.

(127) "Deutschlands betrunkene Autofahrer schreckt kein Kittchen!" Das glaubt Amtsgerichtsrat Heinz Tegtmeier […], Verkehrsrichter in Hessisch-Oldendorf […].
' "Germany's drunken drivers are not frightened by jail!" So believes district court councillor Heinz Tegtmeier, traffic judge in Hessisch-Oldendorf.'

Again, there is only 1 (Dutch) case which is clearly different in principle, viz. (128), from a newspaper review of a movie. In this example the mental state predicate can indeed be taken to be the salient new piece of information provided in the utterance, which contrasts with the assumption raised in the foregoing utterance.

(128) Het is 1881 en dertien jaar geleden dat drie inwoners van het stadje, nu burgers in zeer goede doen, verraad hebben gepleegd in de burgeroorlog. Als officieren hebben ze de positie van hun regiment aan de noordelijken verraden en al hun kameraden gedood. Dat denken ze tenminste, maar Django heeft 't avontuur overleefd en is nu gekomen om wraak te nemen.
'It is 1881 and thirteen years ago since three inhabitants of the little town, now citizens who are doing very well, committed treason in the civil war. As officers they gave away the position of their regiment to the Northerners and killed all their comrades. That is what they think, at least, but Django survived the adventure and has now come to take revenge.'

c. *Contrast*

Like the adverbs (cf. Section 2.4k), parentheticals cannot be used to explicitly contrast epistemic qualifications, as appears from (129).

(129) *They have run out of fuel, I don't just think but know for sure

The complementing predicates, on the other hand, can be used in conditions of explicit contrast, but the situation is again not as with the adjectives. The latter easily allow an explicit opposition of two alternative evaluations in one clause, and such uses were very frequent in the data (cf. Section 2.4d). The mental state predicates, however, are not keen on such a clause-internal

contrast, as (130a) shows. Hence there are no corpus instances. A contrast between two adjoined clauses, as in (130b), is fine, but even of this type there is only one clear instance in the data (a reduced one), viz. (131).

(130) a. ?I don't just think but know for sure that they have run out of fuel
b. I don't just think they have run out of fuel, I know it for sure

(131) A: glauben sie dann aber nicht daß der rundfunk auch eine eigene wirkung auf den hörer hat, auch wenn er die stimme mal nicht vom film her kennt? B: ja das glaube ich nicht nur das wei:ß ich sogar.
'A: don't you believe though that radio also has its own effect on the listener, even if he sometimes does not know the voice from the movies? B: yes I don't only believe so, I even kno:w this.'

In addition, there are a few cases, all in the Dutch data, in which it is unclear whether one can really speak of explicit contrast. One of them is (132).

(132) A: dus moeten we er ook niet erg op rekenen dat je 't ons eventueel vanavond zou zeggen!? B: wel, indien ik de nodige tuchtigingen zou ondergaan misschien wel. maar ik denk niet dat het zal lukken.
'A: so we shouldn't count too much on your telling us tonight!? B: well, if I were punished enough maybe I would. but I don't think it will work.'

The negation in the main clause clearly contrasts with positive polar *wel* in the previous sentence, which in turn contrasts with the negative assumption in A's rhetorical question. The mental state predicate, however, mildly contrasts with *misschien* 'maybe' in B's foregoing utterance (itself a non-salient epistemic expression though), but on the other hand it fully harmonizes with the import of A's question. Similarly in (133), from a discussion concerning whether one should adjust one's clothing style to other people's expectations and wishes, even against one's own taste.

(133) A: […] uw dochter gaat trouwen binnenkort. en die heeft gevraagd van: mam, doe alsjeblieft een rok aan. wat doet u nou? B: dat weet ik nog niet. ik denk niet dat ik 'n rok aandoe, maar misschien dat ik toch iets ga maken wat 'n tussenoplossing is, […].

> ‘A: your daughter is going to marry soon. and she has asked you: mom, please wear a skirt. what do you do? B: I don’t know yet. I don’t think I will wear a skirt, but maybe I will make something which is an intermediary solution.’

The negation in B’s second utterance contrasts with the positive statement immediately following it (the polarity is strengthened by the particle *toch* in the second part, which cannot be rendered in English except by stressing *will*). The mental state predicate, however, in a way opposes to ‘not knowing’ in the preceding utterance and the modal adverb in the following one. But the ‘opposition’ is very mild, and one can hardly speak of a clear contrast (whence also the use of an adverb rather than an adjective in the next utterance). All in all, (132) and (133) can hardly be put on a par with an instance such as (131), or the many contrastive cases among the adjectives.

Also note that the complementizerless complementing forms in German are (again) like the parentheticals in not allowing contrastive constructions at all: cf. (134).

(134) a. *Ich glaube nicht nur, sondern weiß sicher, ihnen ist der Sprit ausgegangen
b. *Ich glaube nicht nur, ihnen ist der Sprit ausgegangen, ich weiß das sogar

Finally, as with the adjectives (cf. Section 2.4), it should be noted that contrastivity is also the cause for the only other focal use of a mental state predicate observed so far, viz. (128) above, even if the contrast is not ‘structural’ there.

d. *Occurrences in backgrounded embedded clauses*

Especially in the Dutch data, a not insignificant number of complementing mental state predicates occurs in a few types of embedded clauses (mostly comparative and relative clauses) which typically express backgrounded information (like the adverbs — cf. Section 2.4g). There are 22 Dutch and 5 German cases, i.e. 9.1% and 3.9% of all complementing predicates. With only 2 exceptions, all of these are descriptive. An example of the comparative type is (135).

(135) De wortels van de geschiedenis zijn wel eens langer dan we denken.
‘The roots of history are sometimes longer than we think.’

This case involves an elliptical pattern: the full form would be *than we think they are*, but the complement is omitted because it is informationally superfluous. This happens in nearly half of the instances in embedded clauses, especially the comparative ones. The salient information is obviously the element in the state of affairs which is subject to the comparison (here the length of the roots of history), and the clause with the mental state predicate only serves as a background for this. An example in a relative clause is (136), about the necessity to counter attempts by the former DDR-regime to discredit the BRD in relations with African countries. The category of 'those who believe they must polemicize against us' has been the topic of several preceding utterances.

(136) also ich habe in verschiedenen ländern […] festgestellt, daß unsre leute […] gerade wenn sie nicht polemisieren gegen den andern deutschen staat wohltuend sich unterscheiden gegenüber denen die nun dauernd glauben sie müßten gegen uns polemisieren.
'well I have observed in different countries that our people precisely when they do not polemicize against the other German state distinguish themselves positively from those who always believe they should polemicize against us.'

Parenthetical predicates also occur in backgrounded embedded clauses in the German data (4 cases, i.e. 10.5% of all parentheticals), but not at all in the Dutch data. The reason for their absence in the latter is unclear to me.

e. *Qualification of constituents only*

The mental state predicates — parenthetical and complementing — are sometimes used to qualify one constituent instead of a complete utterance, and in all those cases the predicate is inherently non-focal. This does not happen very often: there are 14 Dutch and only 4 German cases, i.e. 4.8% and 2.4% of all qualificational mental state predicates. The adverbs are used this way much more frequently (cf. Section 2.4g). Nevertheless, the observation is remarkable since this is an unexpected type of syntactic pattern for a verb. 10 cases are parenthetical and 8 are, strictly speaking, complementing (though elliptically: complementizer and embedded predicate have been omitted), but the difference between the two is very small. This pattern occurs in two types of 'functional' conditions.

- On the one hand it occurs in response to a *wh*-question, when the speaker selects one option out of a series of alternatives explicitly or implicitly presented to him/her by the questioner. In all these cases it is obviously the constituent which is the (only) informationally salient, hence focal, element (very often it even has contrastive focus). A complementing example is (137), about the fact that newspapers are often poorly edited. A parenthetical example is (93) above, partly repeated in (138). The difference in status and effect of the predicate in the two is obviously minimal, if there is one at all.

  (137) A: wie is nu fout? de adverteerders of de kranten? B: ik denk de man die de lay-out of de vrouw die de lay-out maakt.
  'A: who is wrong then? the advertisers or the newspapers? B: I think the man who does the layout or the woman who does the layout.'

  (138) B: woher wissen sie denn das, daß das so war? a: gelesen im geschichtsbuch. B: ah aus m buch. in welchem. A: mensch und geschichte glaub ich.
  'B: from where do you know that it was like that? A: read in a history book. B: ah from a book. which one. A: man and history I believe.'

- This pattern also occurs sentence-internally, to modalize a constituent in the utterance, as in (139) (again a complementing case). Like the adverbial cases of this kind, such uses typically affect only secondary, backgrounded information, and are therefore themselves non-focal. And as in the responsive uses above, the borderline between the complementing cases, such as (139), and parenthetical ones is very thin.

  (139) een warme zondagkamer, een geur van, ik denk bloemkool of spruitjes of zo, sportberichten op de radio, en dan moest je dat spel doen, waar je totaal geen zin in had.
  'a warm Sunday room, a smell of, I think, cauliflower or sprouts or something, sports reports on the radio, and then you had to play that game, although you did not feel up to it at all.'

f. *Semiparenthetical complementing cases*

Not only the elliptical complementing cases in (e), but also several cases with 'full' complements have characteristics which bring them very close to

parenthetical uses. There are a few types of this.

– A clause with a complementing mental state predicate is sometimes introduced by a conjunction which formally specifies the predicate's semantic connection with the preceding clause, but in practice links the complement and not the predicate with that preceding clause. One example is (140), in which the complementing predicate occurs in the apodosis of a conditional.

(140) als er dus nieuwe gegevens zijn […] die twijfel geven over die onvervalsbaarheid, dan denk ik toch dat het goed is dat wij daar in de kamer nog eens over praten met de verantwoordelijke staatssecretaris.
'so if there are new facts which raise doubts about this non-falsifiability, then I think it is good to talk about this again in parliament, with the responsible secretary of state.'

The *if*-clause is obviously not conditional for the subject of the mental state predicate's thinking that it is desirable to raise the issue again, but for the desirability of raising the issue again as such. In all such cases, the mental state predicate, although syntactically integrated, is informationally parenthetical (hence non-focal). There are 8 instances of this type in the Dutch data, not only in conditionals but also in clauses expressing a reason or a consequence. All of them are spoken performative cases. There are no comparable instances in the German data, although they are possible in principle: a few are mentioned in Andersson and Kvam (1984) (see below).

– Sometimes, a constituent from the complement is preposed, as in (141).

(141) maar enige zelfcensuur denk ik dat er op zijn plaats zou zijn […].
'but some selfcensorship I think that would be in order.'

The English translation is unacceptable (it would be acceptable without the complementizer), but it precisely renders the Dutch construction, which is acceptable, though 'marked'. Strictly speaking, the mental state predicate is grammatically integrated, since it takes the entire clause as its complement. But it behaves like a parenthetical relative to the preposed 'embedded' subject. This is a perfect example of a syntactic 'amalgam' or 'blend'. There are 10 Dutch cases of this type, involving

different sorts of preposed embedded constituents. Only one of them occurs in written language, and even this one is a literal quotation from a spoken interview. And there is only one descriptive case (a spoken one). In the German data there are only 2 cases, including the somewhat less prototypical (descriptive) one in (142), which involves an infinitival complement (the other case is in a question and will be discussed in (g) below).

(142) Mit diesem Erfolg glaubt Frankreich, seine Stellung im ‘Klub der Weltraummächte’ gefestigt zu haben.
‘With this success France believes to have settled its position in the ‘club of space powers’.’

Cases of type (141) have been reported before in the German literature, however, under the label ‘Satzverschränkung’. Several of them (mainly spoken ones, but also a few written ones), including (143), are discussed in Andersson and Kvam (1984).[30]

(143) Südlich der Main-Linie glaube ich schon, daß ich jeden verstehen wuerde.
‘South of the Main-line I believe I would understand anyone.’ [Andersson and Kvam 1984: 109]

As they note, the preposed constituent is invariably the focal constituent of the expression. They observe that the phenomenon is fairly rare (though they claim it was more frequent in earlier stages of German, even up to the middle of the 19th century), but nevertheless persistent and very systematic, especially in spoken language, and mainly in first person uses (i.e. performative, in my terminology).[31] Processes such as subject- or object-raising, occurring with this same type of predicate in

30. Andersson and Kvam also include a few instances of type (140) under this label. They consider the conjunctive particle to be part of the complement clause, yet separated from it by the complementing predicate. However, there is no formal, but only a semantic reason to consider the conjunction to belong to the complement clause rather than the clause with the mental state predicate, so strictly speaking these are somewhat different phenomena.

31. They also observe that the phenomenon, though most frequent with epistemic mental state predicates, is not limited to them, but also extends to some other types of complementing predicates, including communication, perception, and emotional attitude predicates.

many languages, are obviously a similar type of strategy, achieving the same kind of effect.

– Also the phenomenon of complementizer omission frequently found in German and English complementing uses of the qualificational mental state predicates results in semiparenthetical forms, since the omission weakens the syntactic tie between predicate and complement (see also Noonan 1985). In German, this omission is accompanied by a few other features strengthening the effect. As can be seen in (91), (116) or (144), it causes main clause word order in the 'complement clause' (also English has this, but there this is the normal word order in an embedded clause, while this is not the case in German).

(144) A: ihre meinung über curd jürgens. B: ich glaube er is besser als sein ruf.
'A: your opinion about curd jürgens. B: I believe he is better than his reputation.'

Moreover, the mental state predicate in this pattern is subject to more or less the same limitations as the real parentheticals, as we have already seen above and will observe again below. The only remaining difference with real parentheticals, then, is the lack of subject-verb inversion and the clause-initial position (according to the definition in Section 3.1 a parenthetical does not occur there). In German, this complementizerless pattern occurs in more than half of the 'full' complementing occurrences of *glauben* (excluding reduced and elliptical variants and cases with an infinitival complement): 52 cases, as against 49 with the complementizer present. (In English, the share of complementizerless cases is even much higher: see Thompson and Mulac 1991.) If we limit this to spoken performative cases, clearly the preferential territory for this pattern, we even find a ratio of 39 to 17 (i.e. 69.6%). (Another difference with truly parenthetical cases is that this pattern is sometimes — albeit rarely: there are only 5 cases in the data — used descriptively. The tie with the complement is then stronger, since in most cases the predicate 'commands' the subjunctive there.) In principle, this phenomenon of complementizer omission is not available in Dutch. Yet the data reveal 2 cases, including (145), which intuitively, though clearly marked, cannot simply be discarded as 'errors'.

(145) ik denk wat er had moeten gebeuren dat is dat iemand van de regering 14 dagen in een huishouden had gezeten van een oprechte minima.
'I think what should have happened is that someone from the government had spent 14 days in a real minimum income household.'

Clearly, then, the dividing line between parenthetical and complementing mental state predicates is far from sharp. The number of complementing forms which shows signs of (degrees of) 'parenthetization' is considerable: if we include the complementing predicates qualifying an isolated constituent mentioned in (e) (7 Dutch and 1 German), then we have 27 Dutch and even 55 German instances. This amounts to 11.2% of the Dutch and even 43% of the German complementing cases. German thus seems to go much further in this than Dutch. Hence, against observations earlier in this chapter, this suggests that German *glauben* is actually further on its way towards grammaticalization than Dutch *denken*.[32]

g. *Questioning*

We have already observed (Section 3.3a) that complementing mental state predicates can, but parenthetical ones cannot be questioned (if the latter occur in questions, they are speech act modifiers instead of epistemic qualifiers). This may have to do with the (un)availability of descriptive uses, but also with the (im)possibility of focusing the expression form (these are not mutually exclusive explanations — cf. Section 2.4i). Even questioned complementing forms show limitations in this respect, however.

Complementing forms, too, often trigger a rhetorical reading similar to that of the parentheticals in questions. This appears always true for the German complementizerless complementing forms (at least intuitively: I have no corpus cases). Thus, (146) can only be understood as a rhetorical question with a reproaching undertone of the type 'don't tell me you find this a good solution'. (This effect is not necessarily present in the English translation.)

32. The fact that the large majority of these semiparenthetical (and parenthetical) cases occurs in performative spoken contexts is symptomatic for the 'progressive' nature of this type of context as compared to others, in terms of flexibility in the use of grammar as well as of it being the prime source for language change (assuming that the development is from the full complementing via the semiparenthetical to the fully parenthetical pattern, of course).

(146) Glaubst du, das sei eine gute Lösung?
‘Do you think this is a good solution?’

And also quite a few of the questions with a ‘full’ complementing mental state predicate in the data (both in Dutch and German) tend to trigger this same reading. In all these cases, then, the mental state predicate again rather serves as a speech act modifying element. And although, unlike in the parenthetical cases, the predicate formally **is** the questioned constituent, the central issue is actually the (absurdity of) the state of affairs in the complement. In other words, the mental state predicate can hardly be considered focal.

But also in non-rhetorical cases answers to the questions often tend to address the contents of the state of affairs rather than its evaluation in the mental state predicate. Thus, in (147) the answer is not ‘I don’t know whether I think …’, but ‘I don’t know whether something will evolve’; and in (148) the answer disregards the ‘belief’ component of the question and immediately tackles the ‘confrontation’ issue. Thus, even in ‘real’ questioned cases, the complementing predicates tend to assume a ‘backgrounded’ role.

(147) A: denkt u dat er iets moois uit kan groeien tussen u en die meneer? B: nou, dat weet ik niet hoor!
‘A: do you think something beautiful can evolve between you and that gentleman? B: gee, that I don’t know.’

(148) A: […] ob es auf dem baugelände nun zu einer konfrontation zwischen den protestierenden gruppen und dem staat kommen könnte. oder glauben sie daß dies jetzt nicht mehr möglich ist. frage an die politiker an den herren minister. B: wir haben nie vonseiten des landes eine konfrontation gesucht. wir haben immer versucht eine verständigung herbeizuführen über die fragen die angeht die hier zur diskussion stehen […].
‘A: whether on the construction site it could now come to a confrontation between the protesting groups and the state. or do you believe that this is no longer possible now. question for the politicians for the minister. B: on the part of the state we have never aimed for a confrontation. we have always tried to achieve an agreement concerning the questions which are at stake here.’

In *wh*-questions, in which the mental state predicate is not the questioned constituent anyway, of course, one also finds the type of pattern in (149) and

(150), from the spoken Dutch and written German data respectively (these are the only corpus instances though; Thompson and Mulac 1991 report similar corpus cases in English).

(149) hoe denken ze meestal dat jij d'eruit ziet?
'how do they usually think you look?'

(150) Sie: Wenn dir das Husten Spaß macht … Er: Nein, aber das Rauchen. Warum trinkst du denn soviel Kaffee? Sie: Zur Anregung. Er: Na, also! Warum glaubst du, daß ich rauche?
'She: If you like coughing … He: No, but [I do like] smoking. Why do you drink so much coffee? She: For the kick. He: Precisely! Why do you think I smoke?'

In purely structural terms, the predicate in these examples is complementing. Still, this use is clearly different from truly complementing cases. Compare (150) and (151).

(151) Why does John think I smoke?

(151) can only be understood as 'why is it the case that John thinks I smoke' or 'what makes John think I smoke', suggesting, in line with the 'skeptical' tendency of descriptive mental state predicates (cf. Section 3.3) that John's assumption is wrong. In isolation, the question in (150) may be understood similarly. But in its context, its semantic structure is clearly different, viz. 'why, you think, is it the case that I smoke'. And there is not the slightest doubt that 'I' does smoke, of course. So the mental state predicate in (150) is semantically parenthetical. A comparable analysis applies to (149). These cases are thus parallel to declarative semiparenthetical cases with a preposed constituent as in (141)–(143) above. And Andersson and Kvam (1984) (who list several similar examples) do categorize them as 'Satzverschränkung' in German. (The present cases have been included in the frequency data in (f) above.) Also note that (150) is again a rhetorical question with a reproaching undertone. But, as in *yes/no*-questions with a questioned complementing predicate, this reading is not compulsory in this construction type: (149) does not have it, and many of Andersson and Kvam's (1984) German examples do not either.

It is actually often difficult to replace the (formally) complementing form by a purely parenthetical one in this kind of pattern, even in cases in which it is used as a speech act modifier (the only way for parentheticals to

occur in questions). Although the tolerance for this differs between languages and even between utterances, as shown in (152). In any case, if one wants to use a pure parenthetical in a *wh*-question, then it seems better to have it in final position (as in (105) in Section 3.3a). This is unlike declarative semiparenthetical cases: a clause-internal pure parenthetical in (141) or (143) is no problem at all. (It is a problem in (142), but that is because we would get a descriptive parenthetical, which is impossible. Cf. Section 3.3.) The restriction does seem to hold (to varying degrees in different languages) in *yes/no*-questions as well, however, as can be seen in (153).

(152) a. ??Waarom, denk je, rook ik?
??Warum, glaubst du, rauche ich?
?Why, you think, do I smoke?
b. ?Wat, denk je, is de goede oplossing voor dit probleem?
(?)Was, glaubst Du, ist die richtige Lösung für dieses Problem?
?What, you think, is the right solution for this problem?

(153) ??Is dat, denk je, de goede oplossing voor dit probleem?
??Ist das, glaubst Du, die richtige Lösung für dieses Problem?
?Is this, you think, the right solution for this problem?

In general, then, questions appear to dislike clause-internal parentheticals.[33] The only explanation I can imagine has to do with markedness: a question is a marked context as compared to a declarative structure, and a parenthetical is probably (still) a marked thing, too. Combining these in more than the simplest way (i.e. by doing more than just juxtaposing them while respecting their internal ‘integrity’) may be too much.

h. *Rejecting an epistemically modalized utterance*

Consider the interpretation of reactions B and B′ in (154) and (155), in view of the assumption that such reactions normally affect the focal information in the foregoing utterance.

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33. Some Germans accept yet another form of a *wh*-question with a qualificational mental state predicate, viz. (cf. (150)) *was glaubst Du warum ich rauche?* ‘what do you believe why I smoke?’ (I have no corpus cases though; this structure is completely out of the question in English or Dutch). Unlike in the (formally) complementing cases, in this pattern the semantic position of the *wh*-word is clear, as it would be in the purely parenthetical case. But it avoids parentheticality, albeit at the cost of a quite strange syntactic pattern. Apparently, some speakers are willing to accept the latter in order to achieve the former.

(154) A: I think they have run out of fuel.
B: That's not true.
B′: That's strange.

(155) A: They have run out of fuel, I think.
B: That's not true.
B′: That's strange.

The situation is not as clear as with the adverbs and adjectives (cf. Section 2.4j). In (155) both B and B′ are normally interpreted as 'it's strange/not true that they (would) have run out of fuel', i.e. as affecting the state of affairs directly (as in adverbial cases). But (154) is less obvious. B′ can certainly mean 'it's strange that you would think so', so one could continue: *yesterday you thought the opposite*. But it seems it can equally be taken to affect the state of affairs. Thus, one could as well continue: *they have never forgotten to take enough fuel with them before*. And in neutral circumstances, reaction B even prefers the state of affairs-oriented reading, no doubt due to general interactive principles: if B were to be a reaction to the mental state predicate, it would more or less mean 'you are lying', and such a reaction requires quite special circumstances (but it **is** possible, of course). Clearly, then, reactions to statements with complementing mental state predicates can affect the state of affairs directly. Hence the complementing mental state predicates do not have the same status as the modal adjectives in terms of information structure.

Note, once again, that the German complementizerless complementing forms are more like the parentheticals: unlike in (154), in (156) both reactions are nearly automatically interpreted as affecting the state of affairs, and not the predicate.

(156) A: Ich glaub, ihnen ist der Sprit ausgegangen.
B: Das stimmt aber gar nicht.
B′: Das ist aber komisch.

i. *Preposing the complement*

Finally, a last observation underscoring the difference between the adjectives and the complementing mental state predicates. It is perfectly all right to put the complement of the adjective in initial position, turning it into a subject clause, as in (157). There is even such a case in the Dutch data: see Section 2.4c. It is quite difficult to prepose the complement of a mental state

predicate, however, as can be seen in (158). (Of course, it is structurally impossible to make it a subject clause in this case.)

(157) That they have run out of fuel is probable

(158) ??That they have run out of fuel I think

As argued, the pattern in (157) is used to background the complement and focus upon the epistemic qualification in the adjective. Intuitively, the same would be the case if one does (158). But apparently the mental state predicate does not like this. In line with this analysis is the observation that (158) improves with negation on the predicate: the negative particle then draws focus. Also the equivalent construction with *believe* appears better, as is shown in (159) (the German equivalent would also seem to work).

(159) That they have run out of fuel I believe

But in this case (also in German) the predicate clearly tends to get the non-qualificational meaning, i.e. ‘that they have run out of fuel I can accept’, and not the qualificational one, i.e. ‘that they have run out of fuel I consider likely’.

To summarize, in principle the complementing and parenthetical mental state predicates are different in that the former do but the latter do not allow focalization of the epistemic evaluation. But in actual usage the difference is small. With very few exceptions the complementing form does not occur in conditions of focality either, so informational salience is a very minor factor even in the use of this form. As expected, then, the parentheticals do have the same informational status as the adverbs, and it is no surprise that they also show grammatical similarities. Thus, at least in Dutch and German the adverbs and parentheticals also have roughly the same word ordering possibilities, except for initial position. But in German the complementizer-less ‘complementing’ form seems to fill even this ‘gap’. But the informational status of the complementing predicates is quite different from that of the predicative adjectives, despite their syntactic comparability. This is clearly reflected in differences in the behavior and even in the structural properties of the complementing forms (which, e.g., often show signs of parenthetization). In the few instances in which mental state predicates do acquire focality, however, they are comparable to the adjectives in that they all seem due to explicit or implicit contrastivity with the discourse context. That is, they always involve contrastive focus.

That parenthetical mental state predicates are inherently non-focal does (again) not imply that they are never prosodically 'highlighted'. Intuitively, they sometimes are, but this involves exactly the same type of special intonation also observed for the adverbs (cf. Lötscher 1985; see Section 2.4). It does not affect the presence of (or even the need for) focal sentence stress elsewhere in the utterance. And it rather functions to strengthen the epistemic/evidential value expressed. This 'qualificational intonation' can also occur on the complementing predicates, though probably not when they are used descriptively, and also not in the rare cases when they are focal. In the latter case they get focal stress, and this is presumably incompatible with other types of intonational highlighting. Anderson (1986: 275f) claims that in a perception predicate such as *hear* the non-evidential (non-qualificational) reading can but the evidential reading cannot get main sentence stress. Apparently, this is not radically transferable to the qualificational and non-qualificational readings of the mental state predicates (at least those considered here). But there does remain a difference between the latter: the qualificational reading only rarely occurs with main sentence stress, and in all other performative cases may get the special qualificational type of intonation, but the non-qualificational reading regularly takes main sentence stress, and can never get the qualificational type of stress.

3.5 Discourse strategy

A factor of considerable importance in the use of the qualificational mental state predicates is discourse strategy. Not surprisingly in view of the nature of this factor, this is limited to performative uses of these predicates. The effects aimed for are again based on the specific semantic qualities of these predicates: their subjective evidentiality and their vagueness in terms of position on the epistemic scale (cf. Sections 3.1 and 3.2). Precisely delimiting the range of strategic usage types and quantifying them in the data is difficult, since what may count as strategic beyond the normal is a matter of dispute (in a way, all language use is strategic), and since there is an enormous twilight zone between clearly strategic and non-strategic uses. Still, most strategic usage types found can be considered variants of the global category of 'politeness strategies'. Most of them occur both in Dutch and German. But overall, strategic uses seem less frequent in German, maybe due

to the different evidential status of Dutch *denken* and German *glauben* (see Section 3.2). Here are a few illustrations.

First, the predicate is sometimes used if the speaker wants to downplay his/her position relative to the interlocutor. This may occur, for example, when the speaker has more expertise concerning the conversational topic than the interlocutor, but does not want to show this dominance in order not to appear patronizing, arrogant or imposing, and/or in order not to let the difference in background have too much effect on the conversation. A Dutch illustrations is (160), in which the Belgian social-democrat Willy Claes, who had just failed to form a new government, is talking about a document he has used in his negotiations and has now made public. A German instance is (161), in which, during an examination on German medieval literature, the examining professor reacts to an unsatisfactory answer by the student. In both cases it is quite obvious that the speaker knows very well and is fully convinced of what he is saying.

(160) maar ik wil u niet versteken dat ik twee redenen had om dat document toch nog op tafel te leggen. eén, er werd al te veel geïnsinueerd dat ik niet de moed had om ’n stelling te kiezen in ’n serie belangrijke problemen. en twee, nog steeds werd, denk ik, op ’n totaal onverantwoorde manier geïnsinueerd dat de socialisten onbekwamen en onverantwoordelijken zijn die niet bekwaam zijn tot ’n crisismanagement. […] dat zijn de twee redenen, denk ik, waarom ik ’n voorstel van programma heb neergelegd dat geen passe-partout-programma is.
‘but I do not want to conceal that I had two reasons for disclosing the document nevertheless. one, there have been too many insinuations that I did not have the courage to choose a position in a series of important problems. and two, it has still been insinuated, I think, in a totally unwarranted way, that the socialists are unable and irresponsible people who are incapable of managing a crisis. those are the two reasons, I think, why I have laid down a program which is not a ‘passe-partout-program’.’

(161) warum willst du denn in die schicht […] der geburtsadligen aufsteigen warum hältst du die denn für besser […] wo du doch als bauer innerlich adlig sein kannst. […] so argumentiert glaub ich der alte helmbrecht, nicht?

‘why do you want to ascend into the class of native nobility why do you consider them better while as a farmer you can be intrinsically noble. that is I believe the way the old helmbrecht argues, right?’

Second, the mental state predicate is often used to ‘hedge’ strong statements in order to make them sound milder, for example when the speaker fears (s)he might offend or hurt the listener.[34] This is illustrated in (162), in which the interviewer directs an unpleasant personal question to the (former) leader of one of the major labor unions in Belgium, Georges Debunne, and in (163), in which a participant in a political debate on German TV introduces a series of critical remarks to a political opponent (the vocative part at the end of the utterance is hard to translate properly into English).

(162) [speaking in general] rond de linkse syndicale figuur van eh- Georges Debunne is vroeger heel wat geroddeld, dacht ik. [now addressing the interviewee directly] zo eh- ben jij de trotse eigenaar van een kasteel […] met in de garage een aantal sport-wagens […]. was dit roddel of is het de waarheid?
‘there have been quite some rumors concerning the left-wing labor unionist Georges Debunne, I thought. thus you are the proud owner of a castle, with a number of sports cars in the garage. was this just rumor, or is it the truth?’

(163) ich glaube jetzt muß ich doch etwas sagen herr kollege
‘I believe it is time for me to say something my dear colleague’

Third, the predicate is very often used as a face-saving device, when the speaker reacts against something which has been said by the conversation partner. This is exemplified in (164) and (165): in both the interviewee reacts to a question by indicating that he has already given an answer earlier.

(164) wel eh- ik dacht dat ik dat al gezegd had zoeven, hé.
‘well, I thought that I had already said that a minute ago, didn’t I?’

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34. ‘Strongness’ is obviously a relative notion, which may depend on factors such as personality, but also social status. Thus, what is felt to be strong will be determined to a large extent by the relative social position of speaker and listener: socially lower-ranking people will no doubt use this type of strategy more often relative to higher-ranking people than vice-versa.

(165) A: was also meine herren hat die leute bewegt was hat dazu geführt daß hier bisher friedliche bürger sich politisiert haben und politischen umweltschutz betreiben wollen? B: ja ich glaube das haben wir doch sehr deutlich gesagt […].
'A: so what gentlemen has moved people what has caused formerly peaceful citizens to politicize themselves and want to participate in political environmentalism? B: well I believe we have said that clearly.'

All these and similar uses, which are obviously not sharply distinct, work in the same way. The subjective evidential meaning of the mental state predicate suggests that what is said is the speaker's own personal opinion, and need not be shared by other people. And its epistemic meaning suggests that the speaker is saying tentative things about which (s)he may actually be wrong. Thus the predicate weakens or mitigates the force of the claim or the reaction, in such a way that it does not endanger the conversation and leaves room for intervention by the interaction partner.

In some cases, this type of use of the mental state predicate may actually cause the opposite effect of making the utterance sound stronger or more aggressive. I have no German illustrations of this, but that is probably accidental as they are perfectly conceivable. A Dutch case is (166), in which the speaker, in a very strong tone, vents his opinion about an attempt by the Italian industrial De Benedetti to get a majority participation in a Belgian holding called the 'Generale Maatschappij'.

(166) de Generale Maatschappij heeft zich over de voorbije 165 jaar systematisch zó onsympatiek gemaakt op talrijke vlakken […] wij zijn deze heren en we zijn dit instituut en dit stuk van het oude België, la vieille Belgique, totaal beu! en dat speelt 'n veel grotere rol mee dan allerhande laten we zeggen schaakspeel-achtige toestanden rond aandelen enzovoorts! en ik denk dat de waarheid gebiedt dat men dat ook 's 'n keer duidelijk stelt!
'the Generale Maatschappij has made itself systematically so unlikable in many respects in the past 165 years we have had enough of these gentlemen and this institution and this piece of the old Belgium, la vieille Belgique! and this plays a much more important role than all kinds of let's say chess-like situations

around shares etcetera! and I think that truth demands that one should also state this clearly for once!'

Another illustration is (167), from a political debate held in a studio which for the occasion has been transformed into a pub in order to create a casual and open atmosphere. The speaker is reacting against what he considers a very unfair attack by another participant.

(167) wel, ik zou willen antwoorden aan meneer Crols! en meer bepaald om z'n woordgebruik hé! ik verzin niets meneer Crols! ik ben geen journalist! ik ben 'n rake politieker. [now follows a long and vigorous argumentation, which is concluded as follows] dus 't gebruik van de woordenschat zelfs in 'n café mag nog altijd 'n beetje met de waarheid en de werkelijkheid overeenkomen, dacht 'k!
'well, I would like to reply to mister Crols! and more specifically because of his use of vocabulary! I don't invent anything mister Crols! I am not a journalist! I am a daring politician. so the use of vocabulary even in a pub should still match truth and reality, I thought!'

It is not absolutely clear what turns the use of the mental state predicates in cases such as these into a reinforcement rather than a mitigation of the expression. But it would seem mainly due to the clash between the very negative attitude manifest in many aspects of the speaker's utterances (among others in the lexical choice, in the choice of very direct constructions, in the tone of voice) and the use of a strategic device which normally serves to mitigate an expression.

In a considerable number of strategic uses in Dutch, including (162), (164), and (167), the predicate occurs in the 'performative past' rather than the present tense (see Section 3.3 above). This is not surprising since this form further weakens the speaker's epistemic evaluation, which perfectly suits the aims of the mitigating use of these predicates (see also Kress 1977). Probably (partly) correlated with this is the observation that strategic uses are more frequent among the parentheticals than among the complementing predicates (the performative past is also more frequent in the parentheticals). In addition, the syntactically 'detached' nature of the parenthetical may

suggest a higher degree of distance of the speaker from the situation, and may thus also contribute to the mitigating effect.

In general, discourse strategy seems a quite frequent factor in the corpus occurrences of the mental state predicates. This may thus be another element causing their remarkably high frequency in spoken language, both as compared to written language, and as compared to the adverbs and adjectives (cf. Table 4 in Section 3.1). After all, discourse strategy is much less important in writing, in which the reader is absent and often not even known. And the adverbs and adjectives are not vague nor subjective (apart from few usages of the adjectives), properties which are essential in the type of strategic purpose described. Of course, the importance of this factor can, again, not be seen independently of the factor of evidentiality: it is to a large extent precisely through the latter that the former is possible at all. Thus, it is also important to remain aware of the fact that the mitigating uses noted above may not be a general property of all qualificational mental state predicates, since not all of them necessarily have a subjective meaning. But other evidential meanings may cause other strategies, of course. For example, as Carretero (1996) argues, intersubjectivity may very well be used by a speaker to mitigate his/her expression, too. Though this probably involves a type of mitigation somewhat different from the one observed above: the 'fact' that a speaker is not alone in holding a certain evaluation can be used by him/her to 'hide' behind the others, i.e. to reduce his/her responsibility for a statement.

3.6 Summing up

Figure 2 offers a rough summary overview of the factors which we have observed to characterize the use of the qualificational mental state predicates, in comparison with the adverbs and adjectives (see Section 2.6 on the meaning of the marks in this figure). The most important element distinguishing the mental state predicates from the adverbs and adjectives, then, is the omnipresence of the evidential component. This factor is also important for understanding most of the typical properties of the descriptive uses of these predicates, and makes the strategic mitigation use of these predicates possible. It should be repeated, however, that, although all qualificational mental state predicates appear to be characterized by an evidential meaning component, this component is not the same in all of them. Moreover, related

epistemic qualification
(probability of the SoA)

↙ ↓ ↘

evidentiality:			
(inter)subjectivity	−	+	++
performativity:			
descriptive use	−	(+)	+
information structure:			
focalized use	−	++	(+)
discourse strategy:			
mitigation	−	−	+
	↓	↓	↓
	adverb	*adjective*	*ms-predicate*

Figure 2. *Factors in the use of modal adverbs vs. adjectives vs. mental state predicates*

to this, it is not clear whether the mitigating use can be generalized to all epistemic mental state predicates.

Figure 2 does not further differentiate between the parenthetical and complementing forms of the mental state predicates, despite some differences between them: both for the 'focalized use' and for the 'descriptive use' the parentheticals would get the negative sign. Still, in general, the two forms are very similar in their behavior, and they do remain variants of the same basic expression type (in fact, as we have seen, there is a continuum from one to the other form). Thus, the factors in which they differ may play some role in a speaker's decision to use one or the other variant, but on most occasions they are probably of little effect. Surely, information structure may be a very important cause for the existence of the parenthetical forms at a 'macrolevel' of language change, as I will argue in Section 6.1. But it is probably not such a crucial element in any single speaker's decision at any point to use this form instead of the complementing one, as appears from the fact that the latter is much more frequent than the parenthetical form even under non-focal conditions.

The use of a parenthetical instead of a complementing form may actually often be caused by an element which has little to do with the functional factors analyzed above, viz. by what linguists have traditionally called 'stylistic' considerations, and/or by what language psychologists would label

as differences in ‘utterance planning’. The use of a syntactically integrated complementing predicate obviously requires more advance planning of the entire utterance than the use of a non-integrated parenthetical, which can be ‘thrown in’ at any time, even when the execution of the utterance has already started, or even after it has been completed. The fact that there are hardly any parenthetical forms in written language in the corpus is in line with this: written language is normally much better planned than spoken language. (But see also the explanation of this fact in terms of descriptivity in Section 3.3 above.)

Chapter 4

Modal auxiliaries

4.1 Some lexical-semantic and grammatical properties

Finally, let us turn to the modal auxiliaries, exemplified in (168).

(168) They may have run out of fuel

These are clearly the most intensively studied among all epistemic expression types, and the literature on them is considerable. This is no doubt due to their in a wide variety of languages recurrent peculiar status in two respects. Structurally, they have the appearance of separate, verb-like morphemes, but they nevertheless behave differently from normal verbs and in fact have properties of grammatical markers. And semantically, they allow expression of three different types of modal qualifications, viz. dynamic, deontic, and epistemic (cf. Section 1.3). This applies not only to the West European languages, but also to many typologically completely different ones (e.g., Steele 1975a). Still, these are not real universals: Bybee et al. (1994: 242) observe a strong trend for deontic and dynamic modality to be expressed in auxiliary forms but for epistemic modality to be expressed in inflectional forms. Moreover, the existence of a system of modals (as a subtype of the auxiliaries) as such turns out not to be universal at all: see Steele (1978).

Despite the strong interest in them the modals remain a highly controversial linguistic phenomenon, however. The problem is that due to the properties mentioned above, they show an enormously complex structural (syntactic and morphological) and semantic behavior. And this behavior moreover turns out to be extremely variable between individual forms and semantic groups of forms, in any one language as well as across languages. This is even true across the three languages considered here, despite their typological closeness. Hence, as will become abundantly clear below, the modals are even more difficult to handle than the mental state predicates.

Like in the previous chapters, before analyzing the modals in terms of the functional factors introduced in Section 1.4, I will first discuss their most important basic linguistic characteristics, both in general and specifically regarding the forms to be analyzed in this chapter, and with special focus on issues related to their epistemic use. Due to the complexity of this form type, this will require much more discussion than in the previous chapters. Also, due to their variability, we will have to be very careful with both intra- and cross-linguistic comparisons and generalizations, more so than for the other expression types.

a. *Characterizing the category of 'epistemic modals'*

The precise delimitation of the category of the modal auxiliaries (and of the auxiliaries in toto, for that matter — Heine 1993) is a controversial matter. Regarding the languages considered here, this has especially been an issue for German (e.g., Calbert 1975; Wunderlich 1981; Öhlschläger 1989). But also for English the status of forms such as *be able to*, *have to* or *want to* is under dispute. (There is actually, quite in general, remarkably little literature on the Dutch modals.) Usually, disagreements boil down to the question whether class membership should be determined primarily in terms of the grammatical or rather of the semantic properties of the forms. However, as Heine (1993) argues, such disputes are futile: membership of the category of the modals is not a binary 'yes-or-no' matter, and differences between individual forms are often just a matter of different degrees of grammaticalization (see, e.g., Bolinger 1980).

The epistemic modals are only a subset of the modals. The modals as a category allow expression of three types of modality, but this is not true for each single modal: most individual forms express only two meanings, and only some of them (also) express epistemic modality. (Some modals also express meanings outside the traditional set of modalities, such as time. See below.) In most forms, the epistemic usage is moreover, at least quantitatively, only 'secondary' relative to (one of) the other usage(s).

In the languages considered here, the epistemic modals are a rather well circumscribed and closed category, like the adverbs and adjectives, and unlike the mental state predicates. It tends to be much smaller than these other categories, however. Moreover, like the mental state predicates and unlike the adverbs and adjectives, the class looks rather different across the languages, in that cognates tend to have a quite different status in each.

For English, Coates (1983) offers a clear picture.[1] Her corpus analysis reveals that only *may* and *might* primarily express epistemic modality. And *could* is sometimes but not primarily used for that purpose. She also characterizes *will* as being primarily epistemic (next to, secondarily, deontic), but that is disputable. She differentiates between a 'predictability' sense, as in (169), and a 'prediction' sense, as in (170), of 'epistemic' *will*.

(169) I hear someone opening the front door — that will be Celia

(170) It will be lovely to see you

The epistemic status of the former is beyond doubt, but this usage is relatively minor. The latter usage is by far most frequent, but whether it is systematically epistemic, too, is questionable. As Coates (1983: 179) mentions, 'some' of these cases involve "little more than a marker of future tense". She does not specify what 'some' actually means, but judging from her examples, this seems to be a very considerable and maybe even the major portion. Such cases cannot be characterized as epistemic modal, however (pace Perkins 1983: 109f; and see Coates 1983: 244 for a relativization of her own analysis). Obviously, situating something in the future unavoidably involves an element of uncertainty: one can never know for sure what will eventually happen. (This no doubt explains why the future tense modal *will* has developed an epistemic meaning.) Still, a 'pure marker of futurity' does not express uncertainty as such, but situates the state of affairs on the time axis (i.e. futurity is its primary meaning). Uncertainty comes along as an unavoidable implication of the future meaning. (To the extent that *will* expresses future tense, it is not 'prototypical' as a modal, since tense does not belong in the classical set of modalities.)

Coates classifies *must* and *should*, and to some extent also *ought*, as expressing 'epistemic inference' (only secondarily though: they are primarily deontic). In American English, *have to* should be added to this list. In the present analysis the status of these forms is unclear, however. Inference belongs in the category of evidential meanings. So used, these modals indicate that the speaker is led to postulate the state of affairs because of

1. An earlier, also corpus-based yet in several respects divergent analysis of the English modals was offered in Palmer (1979). On most points of divergence, Coates' analysis appears preferable, but I will not go into the details of this here.

evidence available to him/her: for *must* and *have to* (rather) strong evidence, for *should* and *ought* weaker evidence. E.g., the difference between *he will have forgotten about the meeting* and *he must have forgotten about the meeting* is not one of 'strength' but rather of the nature of the evaluation: pure probability in the former, inference in the latter. As with inferential adverbs, adjectives, and mental state predicates (see Sections 2.1 and 3.1), it is unclear whether the element of probability attached to the inferential forms is inherent to them (i.e. lexical) — in which case they are mixed epistemic and evidential expressions — or whether this is rather a mere implication of the evidential meaning.[2] (In the present analysis, then, the traditional view that the modals allow expression of three types of qualifications is not entirely adequate: evidentiality should be added to the list.)

In Dutch, the set of epistemic modals is even smaller than in English: it consists of *kunnen* 'may' and *zullen* 'will'. (These forms are often combined, with *zullen* in the preterit, in *zou kunnen* 'might', 'could'. I will henceforth call this the 'conditional' form of *kunnen*.) But neither form is primarily epistemic. *Kunnen* is predominantly dynamic, and even its deontic meaning is more important than the epistemic one (see below). And like English *will*, *zullen* is probably most often a marker for futurity, and it also has a deontic meaning. The modal *moeten* 'must' (also often used in the conditional form *zou moeten* 'should', 'ought') has, next to a predominant deontic and a not unimportant dynamic meaning,[3] exactly the same inferential meaning as its

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2. Dendale (1994) argues that the French equivalent of *must*, *devoir*, is purely evidential, the epistemic meaning being an implication. But Tasmowski and Dendale (1994) argue for the same status for French *pouvoir* 'may'. For the Dutch and German equivalents, *kunnen* and *können* (see below), this is clearly not maintainable, however. As the analyses in this chapter will show, there are instances in my corpus data in which these modals are used to formulate conclusions from arguments or evidence presented in the preceding context, but this is far from a general rule. Intuitively, the same applies to English *may*.

3. The dynamic meaning involves inherent necessity, subject-internal (a need of the subject, comparable to inherent capacity), as in *ik moet naar toilet* 'I must go to the toilet', or situation-internal, as in *je moet door de keuken om in de tuin te komen* 'you must pass through the kitchen to get into the garden' (implying that there is no other way to do so). English *must* also appears to allow this meaning, even if Coates does not mention it (maybe because it is often very close to the deontic meaning, hence she may have subsumed instances under the latter meaning; Palmer 1979: 91ff does mention it as a distinct meaning category, though). The classical definition of dynamic modality usually only refers to 'ability' and 'inherent possibility', but this is clearly too narrow.

English cognate *must*. So it is subject to the same doubt re its epistemic status as the latter.[4]

The German list is somewhat longer. It includes *können* ‘may’ and *werden* ‘will’ in their present and subjunctive forms. But neither is primarily epistemic: the same remarks apply as for Dutch *kunnen* and *zullen* above. The list also includes *mögen* ‘may’, yet only in its present form *mag* (subjunctive *möchte* can only get a volitional meaning, which — cf. Palmer 1986: 116ff — may be included among the deontic meanings), and *dürfen* ‘may’, yet only in its subjunctive form *dürfte* (present *darf* can only be deontic). *Müssen* and *sollen* have uses which are semantically comparable to those of English *must* and *should* discussed above, so they are subject to the same remarks regarding the relation between the evidential and epistemic meanings.[5]

Thus, Dutch and English only have clearly epistemic modals for expressing positions on the epistemic scale rather far on the positive side, viz. *zullen* and *will*, and close to the neutral point, viz. *kunnen*, and *could* or *may*. (The latter two slightly differ, though: *may*, even in its preterit form *might*, appears somewhat more positive than *could*, or than Dutch *kunnen* for that matter.) German has modals not only for those positions, viz. *werden*, and *können* or *mögen*, respectively, but also for a moderately positive position on the scale (‘probability’), viz. *dürfte*. English and Dutch also allow expression of the latter by means of combinations such as *may well* and *kan goed*, however, which (as Hoye 1997 argues for English) are strongly idiomaticized.

Despite the fact that, as for the adverbs and adjectives, situation on the epistemic scale appears to be the prime organizing principle in this class, the modals are less specific than the adverbs and adjectives in terms of strength. Thus, although *could* and *may* are near the neutral point on the epistemic scale, they are definitely less specific, hence more subject to contextual variation, than the adverb and adjective *possibly/possible*, and even than the adverb *maybe* (even though the latter ‘contains’ the modal). In fact, they can

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4. Sanders and Spooren (1996) also include predicates such as *schijnen* ‘seem’, *lijken* ‘seem’ and *blijken* ‘appear’ among the epistemic modals. However, although these are indeed modal-like predicates, they are purely evidential.

5. *Sollen* also has a hearsay-meaning which is lacking in *should*. But this meaning does belong under the label of evidentiality, of course.

even tend towards probability, depending on the context. And although *will* is strongly positive, it is certainly less specific and more variable than *certain(ly)*: again, it can even indicate probability, depending on the circumstances. The same applies for the equivalents in Dutch and German. And in the latter, also *dürfte* is clearly less specific than *wahrscheinlich*. This higher vagueness is possibly due to the higher degree of grammaticalization of these forms as compared to the adverbs and adjectives (see (b)).

b. *The grammatical status of the modals*

As mentioned, unlike the adverbs, adjectives, and mental state predicates, which are lexical expression types (although we have seen signs of grammaticalization in the mental state predicates, at least in some forms), the modal auxiliaries hold a strange balance between a lexical and a grammatical status: they figure as separate verbal morphemes, yet they also have properties of grammatical markers. This special position (which also applies to the auxiliaries in general) has caused a chaotic variety of views regarding their status, from claims that they are simple verbs to claims that they are grammatical morphemes (see Heine 1993 for a survey). Yet, as Heine (1993) argues, there is convincing evidence for the assumption that they are actually forms on their way from a lexical to a grammatical status. But there is quite some variation in how far they are on this way, among individual modals (cf. Huddleston 1979; Plank 1981; Goossens 1987), among semantic groups of modals (Plank 1981, 1984), and among languages. Thus, in Germanic the epistemic modals tend to be more grammaticalized than the deontic ones, and those more than the dynamic ones (Plank 1981, 1984). This corresponds to the cross-linguistic trend for epistemic, but not deontic or dynamic modality to be expressed in inflectional forms, which are higher on the grammaticalization scale than auxiliaries (see Bybee et al. 1994). But the English modals are generally considered to be more grammaticalized than the German (Heine 1993: 72ff) and the Dutch ones (Goossens 1983).

Determining the grammatical status of specific (groups of) modals is a difficult task, however, because the criteria are not obvious. There are a few classical and largely noncontroversial features. E.g., morphologically, modals have, to varying degrees, a deficient verbal paradigm, and they loose the ability to be marked for features such as person, number, or tense. Syntactically, they loose their autonomy and become dependent on a main verb, while gradually acquiring a fixed position in the clause. But the literature

offers a host of other criteria of which the precise status or relevance is often controversial. An example are the 'NICE'-properties introduced by Palmer (1965). Huddleston (1976: 333–334) questions their diagnostic relevance because they refer to language-specific features which probably have little to do with auxiliarization as such. Yet, whatever the relevance of the NICE-properties (see Section 4.4), language-specificity as such can hardly be used as an argument: features of grammaticalization **must** be situated in the context of the grammatical properties of the language considered. Grammaticalization always means integration into the grammar of a specific language, hence its specific features are bound to be as variable as the grammars of languages. Huddleston (1979) has proposed a much longer list of criteria himself, but their status is not always obvious either. And one can easily find yet other criteria elsewhere, scattered in the huge literature. I will not go further into these (structural) criteria for grammaticalization here, as this would lead me too far astray. But I will return to this issue whenever relevant in the analyses below.

It is sometimes suggested that the development of meanings of the 'tense-aspect-modality' type (i.e. qualificational meanings) as such is a sign of grammaticalization. Hence such meanings are sometimes called 'grammatical meaning' (e.g., Heine 1993). Yet, although it is true that meanings expressed by grammatical markers are usually of the qualificational type, such meanings are also frequently expressed by purely lexical categories (see the previous chapters). So this semantic argument is not valid.

There may be a link between the grammatical status and the semantic 'vagueness' of the modals (see (a)), however. It has often been suggested that grammaticalization involves a process of 'semantic bleaching' or 'desemanticization'. According to an extreme version of this, the auxiliaries lack a meaning of their own, and grammaticalization involves a loss of semantic contents (see Heine 1993: 23, 89ff for references). This is not maintainable. Surely, the auxiliaries do not have a meaning in the realm of the description of elements of states of affairs, a meaning their ancestors used to have before they started to grammaticalize, but lost in the process. But qualificational meanings are meanings. Probably no one would ever maintain that the qualificational mental state predicates and the modal adverbs and adjectives have no semantic contents. Developments from an 'object world' meaning to a qualificational meaning, just like those from one qualificational meaning to another as witnessed in the modals (and many other meaning

changes for that matter), involve loss of one meaning and gain of another (cf. Traugott 1980; Sweetser 1988; Heine 1993).[6]

Nevertheless, the comparison of the epistemic meaning of the adverbs or adjectives and the modals does suggest that grammaticalized forms are semantically ‘bleaker’ than lexical forms. In fact, this observation can be generalized to most or all other qualificational meaning categories. A clear example is time: grammatical tense marking is limited to fairly rough and general divisions, while one can express an infinite number of very specific time indications by lexical means (adverbs, prepositional phrases, etc.). Contrary to suggestions in the literature, bleaching in grammaticalized forms does not result from the semantic changes that take place as such, though. The modals have not developed out of adverbs or adjectives. And the inferential meaning of *must*, e.g., can hardly be said to be more bleached than its deontic meaning, even though the former has developed out of the latter. Bleaching is rather due to the decrease in structural (phonological, morphological, and syntactic) ‘versatility’ of grammatical markers: it is physically impossible to make the same variety of distinctions as in the lexical domain, hence the distinctions made are rougher, and the meaning of each grammatical element is therefore more ‘general’.[7]

c. *The multiple meanings of the modals*

Also the modals’ ability to express several types of qualificational meanings distinguishes them from the expression types discussed in the previous chapters. The mental state predicates alternate between two meanings, too, but this involves a qualificational and a non-qualificational one. Surely, the latter’s qualificational reading as such also involves two meanings, viz. evidentiality and epistemic modality. But both are always present, and the

6. Not all meaning change involves gain of a new meaning, of course, witness English *do*, which has developed from a full verb to a meaningless purely grammatical morpheme.

7. Bybee and Pagliuca (1985: 67ff) link grammaticalization with semantic generalization in yet another way: the increase in grammaticalization in the development from dynamic and deontic to epistemic forms (see (c) below) is accompanied by a widening of scope from the agent to the entire proposition. This obviously involves a quite different sense of generality than bleaching as discussed above. And it is surely not related to degrees (let alone to the process) of grammaticalization per se, since the same difference exists between purely lexical expressions of these semantic categories. This goes to show the danger involved in focusing on just one expression type, a danger to which much of the grammaticalization literature is susceptible.

use of this form type involves a deliberate combination of them. The mental state predicates thus always have the same, albeit complex, meaning: they are monosemous. The modals, however, sometimes express one, and sometimes (one of) their other qualificational meaning(s): they are polysemous.[8]

A more precise characterization of the semantic structure of the modals and of the relationship between their different meanings is not easy, however. At a macrolevel, there turns out to be a cross-linguistically valid global trend for the semantic development of the modals to go from dynamic to deontic and further to epistemic meanings. This pattern is well documented for their historical development: cf., e.g., Goossens (1982), Shepherd (1982), Bybee and Pagliuca (1985), Hanson (1987), Sweetser (1990) (but see Section 4.7 for potential complications). But it also applies for their ontogenesis: cf. Stephany (1986), Shepherd (1993), Guo (1995). (The late acquisition of epistemic modality not only applies for the modals: Hickmann et al. 1993 have observed the same for the qualificational use of the mental state predicates; and see also Stephany 1993.) Clearly, then, this line of development cannot be accidental, and the question is what motivates it. I will return to this issue in Chapter 6. Other hotly debated issues are how these meaning changes in individual modals actually happen, and how one should analyze the status of the different meanings of a modal in different stages of the development ((when) are they (in)dependent?).

At a microlevel, a notorious problem is the recurrent indeterminacy and ambiguity in the use of the modals. Though the normal situation for most uses of most modals is that contextual conditions unequivocally select one of their meanings, in many instances it turns out to be impossible to decide which of the meanings is involved. This property makes the modals semantically volatile and inaccessible. But it is at the same time highly significant for understanding their status and for solving some of the questions regarding their meaning development. For, as Heine (1993) has argued, semantic change is usually accompanied by systematic ambiguity between the old and the new meaning.

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8. There is one modal adverb/adjective — *possible/possibly* (and its Dutch and German counterparts) — which can also express two qualificational categories, viz. dynamic and epistemic modality. But this is obviously not a systematic property of the modal adverbs and adjectives.

Not all cases of ambiguity are relevant though. On the basis of her analysis of the English modals, Coates (1983) distinguishes two types (see also Leech and Coates 1979; Heine 1993, 1995). Either it is impossible to determine which of the alternative readings is meant, although it would be essential to know in order to understand the utterance. Coates calls this ‘ambiguity’. Or it is immaterial for the understanding of the utterance which of the possible readings is actually meant, because they are not mutually exclusive. Coates calls this ‘merger’. An example of the former is (171) (Coates 1983: 16): *must* can have an evidential (inferential) and a deontic (obligation) meaning, and, according to Coates, these two are so different that they are in an either/or situation, which must be resolved in order to correctly understand the utterance. An example of merger is (172) (Coates 1983: 17): *ought* can again be evidential or deontic, but according to Coates these meanings are mutually compatible, and no decision between the two is needed in order to understand the utterance.

(171) He must understand that we mean business

(172) A: Newcastle brown is a jolly good beer.
B: Is it?
A: Well it ought to be at that price.

From a theoretical perspective, the former type of ambiguity is not very interesting, though. For interlocutors, a real undecidable ‘either/or’ case is a miscommunication, which will normally be contested by the listener. If the difference between the readings matters, it is unavoidable for the speaker to make clear which one is meant. Hence, most cases of this type in a corpus will not have been a problem for the interlocutors, but are only ambiguous for the observing linguist, as a result of the limited contextual information in corpus data: the linguist unavoidably lacks a number of contextual features which the real interlocutors did have, and which for them may have disambiguated the case. (This is actually a serious problem for the linguistic investigation of the modals in general, because in very many cases the wider context is the only clue for their disambiguation.) So, in practice there is only one type of ‘real’ ambiguity in actual usage, viz. Coates’ ‘merger’: if the two meanings are possible and compatible, disambiguation is not necessary for the interlocutors, and the ambiguity will probably even go unnoticed for them.

But there is more to the difference between the cases in (171) and (172). In (171), the two potential interpretations appear equally strong: they both come to mind immediately. In (172), however, the deontic meaning intuitively seems strongest: on a first reading without further contextual clues, the utterance is nearly automatically understood deontically. It requires some further reflection to realize that an inferential meaning is possible, too. And it probably requires quite specific contexts of usage for this meaning to become more prominent. A closer look at Coates' corpus findings for *must* and *ought* shows that of the occurrences of *must* 38% are inferential and 59.4 % are deontic (the remaining are 'indeterminate'), but of the occurrences of *ought* only 10.2 % are inferential and 84.1% are deontic (again, the rest is called 'indeterminate'). And among the examples she cites, the deontic and evidential ones of *must* but also the deontic ones of *ought* are all unequivocal cases. But practically all evidential cases of *ought* seem to allow (albeit to varying degrees) a deontic reading as well. For example, in (173) (Coates 1983: 74; example has been simplified) a deontic reading would seem at least as likely as an inferential one.

(173) A: We can't find the manuscript. […] Can you remember where you put it? B: Ehm … A: It ought to be, I suppose, in […] those double grey filing cabinets. Do you remember? B: Yes it should be in there.

This suggests that the (large) majority of evidential instances of *ought* are 'both/and' cases. (As Coates 1983: 77ff indicates, the fairly high number of indeterminate cases nearly exclusively involves instances of 'merger', too.)

This situation may be prototypical for a modal in full meaning change. The above facts all suggest that the evidential meaning of *ought* is only in the process of development, and is not independently established (yet). It is, at least in most uses, no more than an inference from the deontic meaning, in specific contexts supposedly an invited inference. This set of features is definitely not unique for *ought*: for example, it also appears to apply for the evidential meaning of *should*, or (as we will see below) for the epistemic meaning of Dutch and German *kunnen* and *können* 'can/may'. Possibly, it applies to some extent for all modals with frequent ambiguous uses. Owning these features is a gradient phenomenon, of course, and one may expect that an increasing use of the form with the invited inference will gradually lead

to an ‘autonomization’ of the inferred meaning. This will then go hand in hand with contextual diversification of the evidential and deontic uses, and with a decreasing number of ambiguous cases. *Must* and other modals with alternative meanings which cause hardly any or no ambiguity may have gone very far in this direction already.[9]

This view is in disagreement with Bybee et al.’s (1994: 199ff), who assume that the meaning change in *must* is different from that in *should*. The grammaticalization literature makes a distinction between semantic change based on inferential or contextual transfer, of the type just described for *ought*, and semantic change based on metaphorical transfer from a source domain into a target domain (Traugott 1989; Heine et al. 1991; Heine 1993, 1995; Bybee et al. 1994). The common assumption is that the latter normally applies in concrete lexical domains, including in transfer from concrete meanings relating to the object world to qualificational meanings. (One may wonder whether this can accurately account for the semantic development of the mental state predicates discussed in the previous chapter, though. A finer-grained analysis is required to settle this.) But regarding meaning change in grammatical domains, there is disagreement: some suggest metaphorical mapping (e.g. Sweetser 1990), others argue for inferential transfer (Traugott 1989; Traugott and König 1991), and Bybee et al. (1994) argue that it is sometimes one, sometimes the other, the difference between *should* and *must* being a case in point.

As Heine (1995) argues, however, Bybee et al.’s claim that the alternative meanings of *must* (or its German counterpart *müssen*) have radically distinct and mutually exclusive usage contexts is certainly too strong. One can easily find examples which violate the contextual conditions suggested by Bybee et al. (see (e) later in this section). Moreover, pace Bybee et al. (1994: 201), there is no reason why there could not (have) be(en) an inferential link between the obligation and inferential meanings of *must*. As Traugott and König (1991: 209) argue, given the right context, the obligation

9. This is presupposing the view (Bybee et al. 1994, e.g.) that the inferential meaning of *must* developed out of the deontic one. This is not necessarily the case though: the inferential meaning could as well have developed straight out of the dynamic meaning, the deontic meaning being a parallel development (see Section 4.7; and see Goossens 1999 for evidence to this effect.) Even if so, this does not invalidate the principles of the above (and following) argumentation, however.

to do something may lead to the interpretation that it is highly probable that the thing will happen because of the obligation. And as Goossens (1999) shows, in historical data one can trace a gradual metonymic development involving contextual reinterpretation of *must* from a general necessity sense (which he considers closely associated with the deontic sense, but which in my analysis would probably better qualify as a dynamic meaning) via intermediary stages to the epistemic (i.e. inferential) meaning, it thereby being influenced by the deontic use. As Heine et al. (1991) and Heine (1993, 1995) have argued, at least in semantic change in grammaticalized domains, the metaphor model may be appropriate at a macrolevel of analysis, to describe the global link between the starting point and the endpoint of the change, but the real microlevel development is probably only explicable in terms of the inference model.[10] Of course, as soon as the development has gone a far way, the inferential stages are no longer clearly visible, and that may precisely be the problem with understanding the present situation of *must*.

In the logic of linguistic development, one would expect that in the process of acquiring independence alternative readings gradually get 'structuralized', i.e. coded in linguistic form in one way or another (as has happened for the qualificational reading of the mental state predicates — see Section 3.1). What this should involve in the case of the modals, and specifically, how diverging meanings might 'structuralize' in the context of an expression type which is to some extent grammaticalized already, is not clear, however. Probably, the observation that (at least in the languages considered here) there is increasing grammaticalization parallel to the development from dynamic via deontic to epistemic readings of the modals (see (b) above) has to do with this. A full analysis of how this works, and why and how the specific meaning change involved should correlate with features of increasing grammaticalization, is beyond the present analysis. But I will return to elements of this matter in the discussion of the Dutch and German corpus cases below.

Critical in the discussion is the seemingly paradoxical, yet highly

10. One may be inclined to make a similar claim for the development in lexical domains: to say that the development of the qualificational out of the non-qualificational meaning of the mental state predicates is a metaphorical mapping would seem to explain little (it essentially only restates the observation that there is a meaning change). The real question is: how did this change happen? It would be a surprise if this did not involve inferential processes as well.

complex question where context(ualization) ends and where structur(e/alization) begins. Even for modals with well established alternative meanings, selection of a meaning usually depends on specific features of the utterance favoring one or another reading (cf., e.g., Coates 1983; Heine 1995; Silva-Corvalán 1995). This includes the presence of certain temporal or aspectual categories, the nature of the subject, and the 'aktionsart' of the predicate. I will go into some of these later in this section. To what extent such features can be called 'structural', and can thus be related to the structuralization of alternative meanings, is a matter of dispute. One cannot simply call them syntactic, as Coates does, for most of them have a clear semantic flavor. They are, for example, quite different from features such as the presence of a parenthetical structure or of a complement structure with omissibility of the complementizer, which characterize the qualificational mental state predicates. On the other hand, they do appear to be more structure-related than general contextual dimensions such as the nature of the situation in which the modal is used, which may also (co)determine the meaning of a modal. But even this difference is not always obvious.

Thus, consider example (174), from Heine (1995: 27). This expression is automatically interpreted deontically, and the inferential reading is entirely excluded, when at a party the speaker has just tasted a beer and found it too warm. But it is very likely to be interpreted inferentially when the speaker has put a beer in the fridge a few hours ago and is now wagering whether (s)he can take it out. (A deontic reading is not entirely excluded in this context, however. This may be a sign that the inferential meaning of *sollte* is less 'established' than its deontic meaning.)

(174) Das Bier sollte kalt sein
'The beer should be cold'

Yet an essential feature of this contextual difference is the temporal structure (Heine 1995: 33). The deontic reading involves a state of affairs which the speaker would like to see realized in the future ('I have a warm beer now, next time I want a cold one'). The inferential reading, on the other hand, concerns assumptions about the present state of the beer. The question is whether this is so much different from meaning selection on the basis of sentence-internal features such as tense.

The fact that disambiguating the modals usually depends on the linguistic context has repeatedly triggered proposals to treat their different uses as

variants of one basic sense (e.g., Bouma 1975, Kratzer 1978, and Wunderlich 1981 for German; Ehrman 1966 and Perkins 1982, 1983 for English; Silva-Corvalán 1995 for Spanish). This results in abstract meaning postulates such as: 'K(C does not preclude X)' for *can* and *may*, 'K(C is disposed towards X)' for *will* and *shall*, and 'K(C entails X)' for *must*, whereby K is a set of laws (physical, social, rational), C the set of circumstances under which K is relevant, and X the state of affairs referred to (Perkins 1982; Silva-Corvalán 1985). The first meaning definition actually does not appropriately capture the central dynamic 'ability' reading of *can*, as in *John can run like a rabbit*. This reading does not involve the speaker's 'non-preclusion' of John's capabilities. Rather, it expresses with full clarity, in perfectly positive, affirmative terms, that John is able to run like a rabbit. But that aside, these definitions state that these modals express, respectively, a neutral to very weakly positive, a clearly positive, and a strongly positive evaluation, the type of evaluation depending on the actual contextualization. The only real difference with multimeaning definitions of the modals is the omission of the notions 'dynamic, 'deontic', and 'epistemic'.

The question is whether one gains anything by doing this. One definitely loses something: to the extent that the different meanings of individual modals trigger different linguistic behavior (cf. the differences in grammaticalization), one needs those different meanings in the grammar and not only in the context. Also from a conceptual semantic perspective, it is quite obvious that a speaker selects a specific modal form, e.g., to express a strong inferential evaluation, and not to express a strong evaluation, which then happens to be evidential. More generally, by means of the modals one expresses an epistemic evaluation, to some degree, or a deontic evaluation, to some degree, etc., but not a strong evaluation, which is then of some type, or a moderate evaluation, which is then of some type, etc. It is completely counterintuitive to omit from the semantic definition of the modals the semantic notions absolutely primordial for understanding their individual uses. One can also put it this way: would anyone ever propose one abstract meaning for Dutch *bank*, which is a homonym meaning either 'bank' or financial institution, or 'bench' to sit on, and which can usually only be disambiguated by purely contextual means? I would not think so. And I do not see any reasons why this should be different for the modals.

With these general characteristics of the modals in mind, let us turn to the forms which will figure as the corpus cases in this chapter. For Dutch I will focus on *kunnen* 'can/may', which no doubt better suits the traditional concept of a modal than *zullen* 'will'. For, besides the epistemic meaning, the former has a deontic and dynamic one, but the latter has a fairly minor deontic but a very prominent temporal meaning, which does not belong in the realm of traditional modal meanings. *Moeten* 'must' is obviously not selected because of its inferential, or at best mixed epistemic/inferential status. This inferential use moreover accounts only for a very small portion of the occurrences of this modal, and is exceedingly rare in corpus data. For German I will focus on the cognate for the Dutch form, *können*, which may also count as the more typical among the epistemic modals, and which appears to be perfectly comparable to the Dutch form. For the comparison with the other expression types, it should be noted that the adverbs and adjectives *waarschijnlijk* and *wahrscheinlich* and the mental state predicates *denken* and *glauben* were situated rather high on the epistemic scale, while the present forms belong in the range of weak epistemic expressions, near or at the neutral point. Obviously, this may have an effect on at least some dimensions of their behavior, though one does not expect it to affect the fundamental principles of their usage. Nevertheless, we will have to keep an open eye on this.

Corpus observations soon reveal, however, that the epistemic reading of these modals is far from well established. In both languages, it shows a pattern of features similar to that of the evidential reading of *ought*. In addition, intuitions regarding the epistemic use appear quite weak.[11] This seriously obstructs the analyses, but in itself it is obviously another significant sign of the instability of this use. (In view of the centrality of these modals in the system, this possibly extends to all epistemic modals in Dutch and German.) These modals are thus quite unlike their English 'counterpart' *may*, which is well established as an epistemic expression (cf. Coates 1983: 131ff). This should be kept well in mind in the following analyses. Let us take a closer look at this.

11. Hence there were relatively more interpretational differences between myself and the second rater (see Section 1.6) for the Dutch modals than for the other expression types, and a considerable amount of joint deliberation was needed to come to the final classification.

Table 5. *Frequency of* kunnen/können

		Dutch			German		
		EXP	SPK	TOT	EXP	SPK	TOT
Dynamic	n:	754	367	1,121	532	333	865
	0/0000:	43.69	40.06	42.43	27.58	36.14	30.35
	share:	78.4	75.8	77.5	67.3	68.9	67.9
Deontic	n:	119	93	212	145	99	244
	0/0000:	6.90	10.15	8.02	7.52	10.75	8.56
	share:	12.4	19.2	14.7	18.3	20.5	19.2
Epistemic	n:	89	24	113	114	51	165
	0/0000:	5.16	2.62	4.28	5.91	5.54	5.79
	share:	9.3	5.0	7.8	14.4	10.6	13.0

Table 6. *Frequency of ambiguously vs. purely epistemic* kunnen/können

		Dutch			German		
		EXP	SPK	TOT	EXP	SPK	TOT
Ambiguous	n:	89	21	110	113	42	155
	0/0000:	5.16	2.29	4.16	5.86	4.56	5.44
	share:	9.3	4.3	7.6	14.3	8.7	12.2
Pure	n:	0	3	3	1	9	10
	0/0000:	0	0.33	0.11	0.05	0.98	0.35
	share:	0	0.6	0.2	0.1	1.9	0.8

Tables 5 and 6 show the frequency of these modals in the different meaning categories (for the abbreviations, see Section 1.6).[12] In view of the enormous number of occurrences of the modal, both in Dutch and German, I have restricted my analysis to a subpart of the corpus (cf. Section 1.6 for the selection criteria). For spoken Dutch I have only used the VDB-corpus (91,623 words), for written Dutch I have used the expository part of the VDB-corpus plus the newspaper section of the UDB-corpus (172,579 words).

12. The frequencies for Dutch *kunnen* in these tables deviate somewhat from those given in Nuyts (1996b), mainly due to the much larger amount of data taken into account here.

For spoken German I have used a random selection of transcripts from the DSK-corpus (92,129 words), for written German I have used a subpart of the popular scientific and newspaper sections of the MK1-corpus (192,902 words).

Both for German and Dutch, ‘dynamic’ not only covers the core meanings of ‘inherent capacity of an agent participant in a state of affairs’, of the type *he can speak German*, and ‘inherent potential of a situation to allow an agent participant to do something’, as in *the door is unlocked, she can enter now* (‘agent participant’ should be broadly construed — see (d) below). It also includes an ‘iterative’ meaning (i.e. quantificational aspect) of ‘occasionally exhibiting a property’, as in *he can be boring* (meaning ‘from time to time he is boring’). ‘Deontic’ also includes, besides the core meaning of permission, as in *you may go now*, a few, mainly German, instances involving something like volition, as in *wir können uns das nochmal anschauen* ‘let’s (literally: we can) look at it once again’. Comparable cases also occur in Dutch, but they are hard to imagine for English *can* or *may*.

Table 5 offers a maximal count of deontic and epistemic and a minimal count of dynamic cases. In these terms, both languages show exactly the same pattern: across text types, the overwhelming majority of uses is dynamic, the deontic and epistemic meanings are considerably less prominent, the latter even more than the former, especially in the spoken data. The trend is more pronounced in Dutch than in German, however. This is primarily due to the much higher frequency of the dynamic use in Dutch, especially in expository prose. Nevertheless, even in terms of frequency per 10,000 words, the deontic meaning (minimally) and the epistemic meaning (more clearly, especially in spoken language) are less frequent in Dutch than in German.[13]

As for *ought*, however, the epistemic uses of *kunnen* and *können* are characterized by massive ambiguity, specifically with the dynamic reading. Table 6 shows the frequency of purely epistemic and ambiguous cases (the ‘share’ of forms takes into account the dynamic and deontic uses in Table 5). Purely epistemic uses are thus very rare, in Dutch again even more than in German. Also the deontic uses are characterized by frequent ambiguity with

13. The relative frequencies of the different meanings of *können* in German found here are actually very different from those reported in Heine (1995). In particular, the present data show a considerably less prominent position for the epistemic meaning.

the dynamic reading, though less than the epistemic ones: ambiguity occurs in (in total) 71.8% of the German and 76.9 % of the Dutch corpus cases. I will not go into these here. There are no cases of epistemic/deontic ambiguity, neither in the Dutch nor in the German data. This suggests that both readings directly relate to the dynamic reading, but are not directly related among themselves. I.e., there is not a developmental chain from the dynamic via the deontic to the epistemic meaning, but rather a parallel development from the dynamic to the deontic and to the epistemic meaning of these modals (see Section 4.7).

In both languages, the purely epistemic uses are exclusively correlated with one particular syntactic pattern, viz. a complementing construction with the qualified state of affairs in the complement clause and the modal in an impersonal main clause ‘supporting’ existential *zijn*/*sein* ‘be’ as the ‘main’ verb, as in (175a), or a reduced variant of it, in which the deictic subject pronoun can be omitted, as in (175b). Of course, one can debate whether semantically the modal is not the main verb.

(175) a. Het kan/zou kunnen zijn dat ze zonder benzine gevallen zijn
Es kann/könnte sein, daß ihnen der Sprit ausgegangen ist
‘It may/might be that they have run out of fuel’

b. (Dat/het) kan/zou kunnen zijn
(Das) kann/könnte sein
‘That may/might be’

One Dutch case is of type (175a) (in the conditional form), the 2 others (nearly identical ones, occurring in immediate succession only interrupted by a short hearer reaction) are of type (175b) (in the simple present). Of the 10 German cases, 7 are of type (175a) (one in the subjunctive) and 3 of type (175b) (again one in the subjunctive). Examples are (176), from a Dutch interview with the mother of a deserting soldier, and (177), from a German conversation regarding whether movies showing too much violence should be censored.

(176) vanaf 18 mei hebben wij geen enkel teken van leven niet meer van mijn zoon gevonden. het zou kunnen zijn dat wij van 13 tot 18 mei een teken van leven hebben indien dat hij bankopvragingen heeft gedaan.
‘after May 18th, we have not found any signs of life from my

son anymore. it might be that from May 13th till 18th we have a sign of life if he has made bank withdrawals.'

(177) nur eben die gewisse skepsis die ich eben auch habe daß es also […] sehr wohl sein kann daß diese filme […] en sehr schädlichen effekt haben.
'there's only this amount of skepticism which I also have that it may very well be that these movies have a very harmful effect.'

In the corpus data pattern (175) does not occur with readings other than the purely epistemic one, and intuition suggests that it does not allow other readings at all. Even small modifications to it radically change the situation, however. The exclusively epistemic status remains unaffected only by adverbial elements in the main clause modifying the epistemic qualification, as in (177), or by discourse markers such as *of course*, *also*, etc. All other types of modifications turn the construction ambiguous or even non-epistemic. Thus, in (178), about reading scientific texts crowded with technical terminology, the addition of adverbial *mal* 'sometimes' results in preference for a dynamic (specifically: quantificational aspect) reading, even if an epistemic reading is not entirely excluded.

(178) und wenn das dann gleich zu anfang so gehäuft kommt dann kann es mal sein daß man ne ganze seite […] von vorne wieder anfangen kann.
'and if there is an accumulation right at the start then it can/may sometimes be that one can restart an entire page from the beginning.'

Likewise, the presence of a predicative adjective or another non-verbal predicate, which introduces a real main predicate in the main clause, hence reduces the modal back to its 'normal', dependent status, automatically leads to ambiguity. This is illustrated in (179), about whether it is difficult for clergymen to accept the consequences of having taken the vow, and (180), both with a predicative adjective, and in (181), with a predicative noun phrase. Even in (182) the modal is ambiguous, despite the fact that the predicative adjective involves an epistemic concept — 'true' — itself.

(179) als ge dus de gelofte als een reglement […] aanziet, dan kan dat moeilijk zijn.
‘if you consider the vow a regulation, then it can/may be difficult.’

(180) Diese letztere Überzeugung gipfelt in der Schlußfolgerung, daß auch ein scheinbar schlechtes Gerät, eine schlechte Erfahrung und ein schlechter Mensch im Ablauf der Dinge ihre Bedeutung haben, die unter Umständen sehr wesentlich sein kann.
‘This latter conviction culminates in the conclusion that in the course of matters even a seemingly bad apparatus, a bad experience and a bad person have their meaning, which in some cases can/may be very essential.’

(181) Een andere oorzaak kan zijn, dat het veel indrukwekkender is om een programma te maken dat een gehele partij schaak speelt, dan een programma, dat slechts een aantal zetten opzoekt.
‘Another cause can/may be that it is much more impressive to make a program which plays a complete game of chess than a program which only looks up a number of moves.’

(182) Het kan dan wel waar zijn dat Moskou het druk heeft met China en zijn eigen binnenlandse problemen.
‘It can/may be true that Moscow is busy dealing with China and its own internal problems.’

In cases of type (179)–(182), the epistemic reading usually remains likely, but there are also instances in the German and Dutch data in which it is impossible.

In Dutch, even omitting existential *zijn* ‘be’ in (175) (impossible to do in German) undoes the ‘monopoly’ of the epistemic reading. If the modal is in the conditional form (there are 4 such cases in the corpus), an epistemic reading remains more likely than a dynamic one: (183) (the speaker is referring to her own outfit) can be interpreted either, preferentially, as ‘my outfit might be some type of fashion’, but also as ‘it has the inherent potential for being some type of fashion’.

(183) ’k weet niet of dit ’n bepaalde mode is. […] het zou wel kunnen.
‘I don’t know whether this is a certain fashion. it could/might be.’

If the modal is in the simple present, however, the epistemic reading even becomes exceptional: intuitively it is still possible, but there is not a single corpus case, while there are numerous instances of this pattern with a deontic and/or dynamic reading.

The ambiguous epistemic/dynamic corpus cases are of the same type as the evidential/deontic cases of *ought*, viz. involving 'both/and' ambiguity (cf. (c) above). Consider (184), from an article concerning the European Community.

(184) Zijn hervormingen stelt hij [Jacques Delors] dan ook voor met in het achterhoofd een versterking van de Europese eenheid die, in zijn filosofie, solied en onomkeerbaar kan gemaakt worden door het pure ontwikkelen van massa.
'He therefore presents his reforms with, in the back of his mind, a strengthening of European unity which, in his philosophy, can/may be made solid and irreversible by the pure development of mass.'

This can mean that the 'pure development of mass' (adding more countries, people and money to the EC) is 'able' to solidify European unity. Or rather: by means of the pure development of mass 'one' (not expressed in the passive construction) is able to solidify unity. This is a dynamic reading. But (184) can also mean that there is a chance that European unity will be strengthened through a pure development of mass. This is an epistemic reading. Both readings are perfectly compatible, and the epistemic reading can be inferred from the dynamic one: if Delors assumes that there is an inherent potential for strengthening the EC, then normally one may infer that he also assumes that there is a chance that this will happen. One needs counterindications to invalidate this implication. Likewise, consider (185), from a phone conversation on German public radio on the fact that youth tend to be skeptical about the(ir) future.

(185) und wenn sich das auch dreifach potenziert dann […] kann das sehr gefährlich werden und das kann also […] n fall für n psychotherapeuten werden
'and if this also triples in strength then this can/may become very dangerous and this can/may also become a case for a psychotherapist'

Both occurrences of *kann* can mean either, dynamically, that a serious increase in scepticism holds the inherent potential of becoming dangerous and a case for a psychotherapist, or, epistemically, that in case of such an increase there is a chance that the situation will end up being these. The type of implicational relation in (184) also holds here (and in all other corpus cases).

Among individual cases there is considerable variability in the relative prominence of the dynamic and the epistemic readings, however, and there is a cline from predominantly dynamic to predominantly epistemic cases. In (184) and especially (178) above the dynamic reading predominates. In (179)–(181) and (185) the epistemic reading is at least as prominent as the dynamic one. And in (182) and (183) the epistemic reading clearly prevails. It is impossible to quantify these categories, however.

As has been observed for other modals in other languages (e.g., Coates 1983; Heine 1995 — see (c) above), the possibility to get one or the other reading can be correlated with a number of semantic features of the expression in which the modal appears, which are directly related to the nature of dynamic vs. epistemic modality. A detailed analysis of this would be essential for our understanding of (epistemic) modality and the modals. But this is beyond the present investigation, as it would require an in-depth concern with dimensions such as Aktionsart and time, which are poorly understood problem areas themselves. Still, a glance at the crucial conditions is revealing for the nature of the relationship between the dynamic and epistemic readings.

d. *The nature of the state of affairs*

Dynamic and epistemic modality (and deontic modality) fundamentally differ in how they relate to the participants in the state of affairs (cf. Section 1.3). Dynamic modality characterizes the capacity of or possibility for the first-argument participant to do what is involved in the main predicate of the clause. It is thus fully ‘agent-oriented’ (if ‘agent’ is interpreted broadly). Epistemic modality, on the other hand, does not hold any specific relation to the first-argument (or any other) participant, but specifies an attitude of the speaker towards the state of affairs in general. It is thus fully ‘speaker-oriented’. (Deontic modality holds a middle position between the two: the moral value expressed by the modal is directed at the first-argument participant, but the speaker is its source or mediator.)

In view of this, dynamic modality is prototypically associated with one particular type of state of affairs or Aktionsart, viz. an activity (a dynamic state of affairs) controlled by someone or something (that both the Aktionsart and the qualification are labeled ‘dynamic’ is no coincidence, of course). In the purest case, this control is completely exerted by the first-argument participant, typically an animate agent. This leads to the ‘ability’ reading of the modal, as in *John can drive a truck.* The control can also partly be beyond the first-argument participant, i.e. due to other explicit or implicit factors in the state of affairs, although the activity still depends on the first-argument participant, too. This leads to the ‘inherent potential’ reading of the modal, as in *John can drive the truck now (the mechanic has fixed the clutch)*. Note that although the potential actor typically appears as the subject of the clause, this need not be the case. In extreme cases, (s)he/it is not even expressed at all, e.g. when a passive(-like) construction is used. One illustration involving an ambiguous use was (184) above. An unequivocally dynamic instance is *op het plein kan nu ook gevoetbald worden* or *auf dem Platz kann nun auch Fußball gespielt werden* ‘on the square soccer can now also be played’ (as the translation shows, this kind of pattern appears difficult in English): it refers to the circumstances (e.g. reconstruction of the square) now allowing any unmentioned person to play soccer there.

The epistemic qualification, on the other hand, is not inherently linked with any particular Aktionsart: obviously, one can estimate the chances of the occurrence of an activity as well as of a state, controlled or not.

When interpreting tokens of the modal, then, if one is dealing with a typical controlled dynamic state of affairs, and if none of the other factors to be discussed below interferes, one automatically and exclusively gets a dynamic reading. Possibilities for an epistemic reading only occur when the elements of control and/or dynamicity are weakened. This is a gradual matter: there is decreasing ability to be a controller in the list ‘human, animal, inanimate or abstract force, lower-level living being such as a plant, object’, and there is decreasing dynamicity in, e.g., nervously jumping up and down, running the marathon, having a phone conversation, sleeping, and having blue eyes. The epistemic reading is most likely when there is both a completely stative predicate as well as complete absence of control, on the part of the first-argument participant or any other explicit or implicit participant in the state of affairs who/which can be construed as a controller (cf. e.g.

(185) above). Thus, it is no surprise that the pattern in (175) above is specializing for the epistemic meaning, as it is a perfect prototype of the latter kind of state of affairs. Nevertheless, apart from pattern (175), even if the conditions for the dynamic reading are poor and, ipso facto, those for the epistemic reading excellent, there does remain pressure to allow a dynamic reading, probably purely as a result of the fact that the modal keeps on bringing it along as its most prominent meaning. In a way, the use of the modal as such (still) forces one to try to find some kind of dynamism and/or control in the state of affairs, however farfetched this may be (as in (182), (183) or (185) above, e.g.).

All of this goes to show that the dynamic meaning of this modal is more central than the epistemic one. In principle, the 'range' of the epistemic meaning should be widest given its combinability with any type of Aktionsart. Yet in practice it only occurs if the possibilities for the dynamic reading diminish. And even if the latter have become very poor, the dynamic reading does remain present to some extent.

e. *Tense and the temporal position of the state of affairs*

Parallel to their different relation with the participants in the state of affairs, dynamic and epistemic modality also have a different relation to the temporal position of the state of affairs. Since dynamic modality indicates a property of the first-argument participant, it is bound to the temporal position of the state of affairs. If the state of affairs is situated in the past, present or future, this automatically means that the ability of or inherent potential for the agent to realize it is so, too. Epistemic modality does not relate to the internal specifics of the state of affairs, however, so it is not linked to its temporal position either. Rather, it relates to the temporal position (the hic et nunc) of the speaker (cf. the issue of performativity vs. descriptivity). Thus, in an epistemically modalized expression the temporal location of the state of affairs and of the epistemic qualification are in principle mutually independent.

Now the epistemic reading of the modal appears possible only when it is in the simple present *kan*/*kann*, or in the Dutch conditional *zou kunnen* or German subjunctive *könnte*[14] form (which also get a present reading: the

14. German *könnte* is the 'Konjunktiv II' form. There are also epistemic occurrences with 'Konjunktiv I', *könne,* viz. in the context of reported speech: *Hans meint, diese Behauptung*

conditional/subjunctive further modifies the epistemic qualification). There are no epistemic corpus cases with the modal in any of the other tenses, such as past *kon(den)*, *konnte(n)*, present or past perfect *heeft*/*had kunnen*, *hat*/*hatte*/*hätte können*, or future *zal kunnen*, *wird können*. And intuitively they seem impossible (maybe except in pattern (175) and for restricted non-temporal uses of the past — see Section 4.3). Why this should be so will be discussed below. The dynamic reading is possible in any of the tense forms of the modal.

This means that ambiguity only arises in the present and conditional/subjunctive forms of the modal. In those forms, then, the chances for an epistemic reading improve when the state of affairs can be interpreted as being non-present, i.e. past or future. In that case there is (at least in principle — see below) a discrepancy between the time of the state of affairs and that of the qualification, which is impossible for a dynamic qualification but fine for an epistemic one. This situation can be triggered by lexical means expressing temporal non-presence (e.g. a temporal adverb or prepositional phrase), or by the tense marking in the verbal group (though with limitations, since the modal is part of the verbal group hence formally participates in expressing tense — see below). Or it can be inherent in the state of affairs: e.g., if one is talking about potential consequences of something, this inherently refers to the future. The latter is often hard to estimate, however. For instance, the borderline between a generic (i.e. timeless, hence also applicable in the present) and a future interpretation of a state of affairs is usually fuzzy: in written German example (186), both are possible (and in a way both are present), hence both the dynamic and the epistemic reading of the modal are available.

(186) Wenn in einer Statistik zu lesen ist: 1723 waren es 1705 Einwohner […], 1765 aber 1796, so kann dies zu Verwirrungen führen.
‘If in a statistics one reads: 1723 there were 1705 inhabitants, 1765 however 1796, then this can/may cause confusion.’

In the corpus data, then, there are only few ambiguous cases of the modal with a present state of affairs. Clearly, such a context does not

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könne stimmen ‘according to John this claim may be correct’ (see Section 4.3 on such uses). This Konjunktiv I is then a marker of quotative evidentiality.

sufficiently favor the epistemic reading, hence the dynamic one nearly always prevails. For English, Coates (1983) has observed that the progressive (in a way a present) exclusively triggers an epistemic reading of modals. This seems true for Dutch and German as well: *Jan kan aan het zwemmen zijn* ‘John may be swimming’ cannot be understood dynamically, and see Heine (1995: 24) on German. For obvious reasons: it makes no sense to ascribe an ability to perform an activity to a subject if the subject is already performing it. That is, dynamic modality and progressive aspect are incompatible. Unlike in English, in Dutch and German progressive forms are hardly ever used, however, and I have not a single corpus case containing a modal.

The overwhelming majority of ambiguous cases in the data involves (more or less equally) generic or future states of affairs in German, and future states of affairs in Dutch. Generic cases are rare in the Dutch data. Why this difference should exist is unclear to me. Somewhat surprisingly, ambiguous cases with a past state of affairs are quite rare, even rarer than cases with a present state of affairs, both in Dutch and German. Of course, pace claims to the contrary (see below), future states of affairs appear the best context for triggering an epistemic reading, since the future is inherently uncertain. Apparently, only in those circumstances the predominance of the dynamic reading gets overruled easily.

But even with future or past states of affairs, the dynamic reading is not excluded. For future states of affairs, this is partly because in Dutch and German (as in many languages) future time reference is often achieved by means of present tense. So a modal in the present can be interpreted as futurate, hence allowing a dynamic reading. Thus, consider (187), from a Dutch interview with a wild-beast tamer who is talking about his future chances to win a prize if his partner would support him.

(187) als ik haar zover kan krijgen, dan denk ik dat ik misschien een 2de Oscar Carré Trofee kan verdienen.
‘if I can get her that far, then I think that maybe I can/may earn a second Oscar Carré Trophy.’

The speaker can mean either that in the future he will be able to win a second trophy, or (more likely due to the co-occurring epistemic expressions) that at the moment of speaking he considers it not unlikely that he will win a second trophy in the future. If the present tense form of the modal is replaced by the future form *zal kunnen*, the epistemic reading is no longer available.

Also in the few corpus cases with a past state of affairs, the modal in the present does not disallow a dynamic reading. In all of them the past is marked by means of a present perfect (a form frequently used for past time reference in Dutch and German). The present perfect of a verbal group containing a modal can take two forms: the modal can be non-finite, as in (188a), or it can be the finite verb, as in (188b).

(188) a. Hij heeft kunnen dansen
Er hat tanzen können
'He has been able to dance'
b. Hij kan gedanst hebben
Er kann getanzt haben
'He may have danced'

In (188a) only a dynamic reading is possible, as expected since the modal is unavoidably 'covered' by the present perfect marking. (188b), however, is intuitively exclusively epistemic: apparently, the modal, which is strictly speaking present tense, is interpreted as not partaking in or affected by the present perfect marking. Yet, against this intuition, all corpus cases of type (188b) appear to allow a dynamic reading, too. Thus, although in (189), from a Dutch popular scientific text on Darwinism, the epistemic reading is very prominent, the reading that natural selection has (had) the inherent potential of having been a guiding principle is not entirely excluded. Likewise, in (190), from a German popular scientific text on chemical evolution, an epistemic reading is absolutely preferential, but the reading that there is a (situationally determined) inherent potential for DNS- and RNS-molecules to have developed in a short period of time is not unimaginable.

(189) Hij [Michael Denton] staat niet helemaal afwijzend ten opzichte van de evolutietheorie en geeft toe dat natuurlijke selectie inderdaad een leidraad geweest kan zijn bij het bepalen van welke soort wel en welke niet veranderde tot er een nieuwe ontstond.
'He does not entirely reject evolution theory and admits that natural selection may/can indeed have been a guiding principle in determining which natural kind has and which has not changed until a new one evolved.'

(190) Angesichts des Nachweises der Schnelligkeit, mit der sich in der Urzeit Aminosäuren zu Eiweißstoffen kondensierten, glaubt Dr.

> Ponnamperuma an die Möglichkeit, daß die damals gebildeten Eiweißstoffe […] die Bildung vermehrungsfähiger Substanzen beschleunigt haben, so daß für die Bildung der ersten DNS- und RNS-Moleküle ein viel kürzerer Zeitraum genügt haben könnte, als bisher angenommen wurde.
> ‘In view of the proof of the speed with which in early times amino acids condensed to proteins, Dr. Ponnamperuma believes in the possibility that the then formed proteins accelerated the formation of self-reproducing substances, hence the formation of the first DNS- and RNS-molecules could/might have taken much less time than has been assumed so far.’

Two elements may figure in allowing a dynamic reading in such cases. On the one hand, it appears difficult to express the dynamic meaning in these examples by means of a present perfect of type (188a): using *hat genügen können* in (190) or, even more clearly, *is kunnen zijn* in (189) feels strange. This is true in the other corpus cases as well. This suggests formal limitations on the use of variant (188a). Maybe there is a tendency to avoid the infinitive form of the modal (which would fit in a pattern of continuing grammaticalization of the modal), whence the use of pattern (188b) also for expressing dynamic modality. On the other hand, both in (189) and (190), as in a few more corpus cases of this kind, the phenomena described are due to general laws or principles which are presumably timeless (evolution theory, elementary chemical processes in the development of life, etc.). Their ability to be guiding principles in the processes mentioned in these utterances is thus not limited to the past, whence, possibly, the feasibility of a dynamic reading.

The foregoing casts doubt on the recurrent claim that ‘root’ or ‘agent-oriented’ modality always concerns future states of affairs (Coates 1983: 233ff; Bybee et al. 1994; Heine 1995: 33ff; Coates does make an exception for the ability reading of English *can*, however). This may be largely true for deontic modality, but as shown, it does not apply at all to dynamic modality. (This again shows the infelicity of conflating these two semantic dimensions into one category — see Section 1.3.) The foregoing equally preempts the ‘rumor’ that epistemic modality would not be compatible with future states of affairs. This probably derives from Bybee et al.’s (1994: 200) claim that the ‘inferred certainty’ reading of English *must* never occurs with such states of affairs. This claim as such seems untrue, and

Bybee et al.'s own supporting example is a case in point: *the letter must arrive sometime next week* does allow an inferential reading, e.g., in a context involving the reasoning that 'I have sent it airmail, and airmail from Europe to the US usually does not take more than a week'. It is true, though, that inferential *must* rarely occurs with future states of affairs (Coates 1983: 45).[15] One might think this is due to the inferential meaning component: drawing on past evidence makes it more likely that one is talking about past or present states of affairs. But this is countered by inferential *should* and *ought*, which are most frequent with future states of affairs (Coates 1983: 65, 74). Coates (1983: 45), on the other hand, suggests that certainty may be an inappropriate feeling to have about the future. Yet epistemic *will*, also expressing high probability, is mainly linked with future states of affairs. An explanation for the 'future-unfriendliness' of inferential *must* is outstanding.

f. *Co-occurring (in)compatible expressions*

Another element affecting the interpretation of the modal is the occurrence of other semantically compatible or incompatible elements in the utterance or the immediate context. In (182) above, the epistemic reading is enforced by the predicative adjective *waar* 'true', which pulls the utterance in the epistemic sphere. Similarly, in (187) above the occurrence of an epistemic mental state predicate and adverb, which can be interpreted as 'harmonic' (cf. Lyons 1977) with an epistemic reading of the modal, makes the latter more likely. On the other hand, in (178) the presence of (quantificational) aspectual *mal* 'sometimes' makes the epistemic reading very unlikely, although the conditions in terms of factors (d) and (e) above would favor it. Similarly, the presence of a conflicting adverb such as *zeker*, *sicher* 'certainly' makes an epistemic reading nearly impossible: one cannot express two conflicting epistemic qualifications in one utterance. (The fact that in (187) and many other Dutch and German cases the mental state predicate is interpretable as harmonic with the modal, while strong epistemic adverbs and

15. This may (partly) be why in *you must be careful* the deontic meaning predominates, while in *you must be careless* the evidential meaning first comes to mind (Wunderlich 1981): carefulness is an attitude one tends to recommend for the future, but carelessness is not. These are only strong tendencies, however, and one can easily construe contexts which overrule them.

adjectives are not, is no doubt due to the vagueness in terms of epistemic strength of the former.)

A special situation arises when modal auxiliaries are combined, something not allowed in English, but, within limits, perfectly alright in German and Dutch. In Dutch, the combination *zou kunnen* ‘could’, ‘might’ (literally: ‘would can’) clearly improves the chances for an epistemic reading of *kunnen*, even if it does not exclude a dynamic reading (similarly, in German *könnte* the subjunctive improves the chances for an epistemic reading). The combination *zal kunnen*, *wird können* ‘will can’, in which *zal* and *wird* can be interpreted temporally or epistemically, excludes an epistemic reading of *kunnen* and *können*, however. Similarly, the combination *moet kunnen*, *muß können* ‘must can’, in which *moeten* and *müssen* can be (preferentially) deontic or (rarely) evidential, excludes an epistemic reading of *kunnen* and *können*. Pretty much the same applies for any combination of modals in which *kunnen* or *können* is the non-finite verb. But if *kunnen* or *können* is the finite verb (there are only few possibilities for this, however), as in *kan moeten* or *kann müssen* ‘may have to’, it unavoidably draws an epistemic reading. Which modal combinations are possible, and how they affect the reading of the modals, is probably a matter of the relative scope of the types of qualifications (epistemic, deontic, and dynamic modality, tense, etc.) expressed by them (see Chapter 6).

Apart from those in (d)-(f), there are yet other elements which affect the chances for getting an epistemic reading of the modal (e.g., the presence of negation) but they are quite different in nature and can be related to the functional factors discussed later in this chapter.

The functioning of the above factors, then, clearly indicates that the dynamic reading is the default. It requires special conditions to enable the epistemic meaning, but the dynamic reading hardly ever gets disabled.

To summarize the discussion of the corpus observations about *kunnen* and *können* so far, there is considerable quantitative and qualitative evidence showing the unstable position of the epistemic use of this modal in Dutch and German (and in the former probably even more than in the latter in view of the, albeit small, quantitative differences). In most circumstances the epistemic meaning is (still) dependent on, i.e. a productive (invited) inference from, the dynamic meaning. Only in the context of pattern type (175) does the epistemic meaning appear to acquire independence from the dynamic meaning.

This pattern actually also occurs with some other modals in Dutch, German and English, intuitively equally leading to a strong preference for or exclusivity of an epistemic or evidential reading. This pattern may thus be specializing for the epistemic use, but its very low frequency and its inflexibility reveal that it is still unstable, too. The fact that, as the following sections will show, linguistic intuitions regarding this pattern appear even weaker than for the epistemic uses of the modals in general is in the same vein.

That the epistemic modals should tend towards the development of such a complementing pattern is actually remarkable in a few respects. Firstly, they thus acquire a syntactic pattern comparable to that of the predicative adjectives and the complementing mental state predicates. This again underscores the special affinity between epistemic modality and the syntax of complementation (see Section 3.1b). But the tendency towards such a pattern here is of course directly opposed to the trend we have noticed for the mental state predicates to reduce their complementing pattern. These observations will require further attention (see Sections 4.4 and 6.1). Secondly, one may wonder how the development of this pattern should be interpreted in terms of traditional assumptions about increasing grammaticalization of the modals (cf. (b) above). Obviously, we are witnessing a kind of structuralization of the epistemic meaning, yet one which can hardly be said to lead to a higher degree of grammaticalization: at least, it does not involve the typical properties usually ascribed to grammaticalization, such as increasing syntactic, morphological and phonetic erosion (cf. Heine 1993). Whether this means that the common assumption of a strict directionality in grammaticalization should be given up, or, alternatively, that grammaticalization is more complex than assumed, is an open question (see also Section 6.1).

In the 'basic' (non-complementing) pattern the epistemic modals do show features which fit classical assumptions about continuing grammaticalization, however. As observed in (e) above, an epistemic reading normally does not occur in tenses other than the present or the conditional. In one case in the written Dutch data, (191), there is even lack of number agreement between subject and modal, although it is in principle required in Dutch. This could of course be a simple mistake, but intuitively it feels alright to do this.

(191) Hun inspanningen om hoge-energielasers voor luchtverdediging te ontwikkelen kan in het begin van de jaren 1990 leiden tot de plaatsing van grondlasers […].

> 'Their efforts to develop high-energy lasers for air defense can/may lead in the early nineties to the instalment of ground lasers.'

Absence of tense and agreement marking obviously both mean a step towards a further impoverishment of the morphology of the epistemic modal (as already exists in the English modals), i.e. further grammaticalization.

These features are perfectly explicable in terms of a clash between the syntactic and the semantic position of the epistemic modal relative to the (expression of the) state of affairs, however. Unlike the other predicative epistemic expression types (the adjectives and mental state predicates), the syntactically 'non-autonomous' modal is part of a verbal group together with the predicate which expresses the central relation of the state of affairs proper and which actually 'commands' the subject and the tense marking. Since the epistemic qualification is semantically independent from the internal structure of the state of affairs, however, it is perfectly natural that the modal expressing it should get dissociated from the tense marking and the coding of the subject. This goes to show that grammaticalization is not an independent process and cannot in itself serve as a principle explaining form changes, pace suggestions to the contrary. E.g., Heine (1993) 'explains' the existence of auxiliaries purely by reference to the principle of grammaticalization. Yet grammaticalization is an observational term covering a cluster of phenomena which are somehow determined by, and should thus be explained in terms of cognitive-functional factors. (See also Section 6.1 on the reasons for the development of the auxiliaries as a category.)

Table 7. *Frequencies (0/0000) of alternative epistemic expression types*

		Dutch			German		
		EXP	SPK	TOT	EXP	SPK	TOT
Adverb		1.89	2.58	2.22	1.06	3.64	1.81
Adjective		0.37	0.05	0.28	0.32	0.35	0.33
MS predicate		1.95	25.65	7.60	1.72	9.88	4.17
Auxiliary	max	5.16	2.62	4.28	5.91	5.54	5.79
	min	0	0.33	0.11	0.05	0.98	0.35

Table 7 compares the frequencies (per 10,000 words) of the modals and the expression types analyzed in the previous chapters. This comparison obviously faces the difficulty that it is impossible to know how many of the ambiguous cases of the modal are really meant epistemically. Normally a speaker will probably not intend to express both dynamic and epistemic modality, but will intend either. If (s)he intends the epistemic meaning, (s)he uses the modal with the intention that its dynamic meaning combined with the context will invite an inference towards an epistemic meaning. It is essentially impossible for the hearer and the observing linguist to know when this applies, however, since the inference may not be invited but accidental. So not all ambiguous uses are intended epistemically, but we have no means of knowing how many are. The real frequency of intentional epistemic uses is thus situated somewhere in between the maximal and the minimal counts for the modals in Table 7.

Apparently, the modal is relatively more important in written than in spoken language. In the spoken data, it is at best more or less equally or (in German) somewhat more prominent than the adverb, and at worst it is nearly as rare as the adjective. It is clearly less important than the mental state predicate, especially in Dutch. In expository prose, however, in the worst count it is even rarer than the adjective, but if we assume that a reasonable portion of the ambiguous uses is intended epistemically it is clearly the most frequently used epistemic expression type. Thus, when expressing an epistemic evaluation, in both languages speakers appear to favor a mental state predicate (for reasons discussed in the previous chapter) while writers tend to use a modal. Why the latter should be the case is not immediately apparent.

At last, let us turn to the analysis of epistemic *kunnen* and *können* in terms of the factors introduced in Section 1.4. All ambiguous cases will be included, keeping in mind that not all of them may have been intended epistemically (possibly this affects some of their properties). As indicated, linguistic intuitions regarding these forms are often highly uncertain, especially for the complementing pattern, which frequently defies intuitive judgment altogether. Hence, though occasionally I will provide constructed examples, similarly as in the previous chapters, it will often prove difficult to use them in a conclusive way, and the analysis will mainly have to be based on what can be found in the corpus data. Also recall that *kunnen* and *können* behave quite differently from their English counterpart *may*: unlike

in the previous chapters, English often cannot be used to illustrate properties in Dutch and German, and in the examples it is important not to be biased by the properties of the English translation.

4.2 Evidentiality

As discussed in Section 1.4, Lyons (1977: 798) motivated his distinction between subjective and objective (i.e. intersubjective) modality by showing that *may* in *Alfred may be unmarried* can express the one or the other depending on the context in which it is used. A similar observation applies for *kunnen* and *können*. Thus, in (192), from a Dutch popular scientific text on child psychology, or in (193), from a German popular scientific text on astrophysics, the evaluation has an intersubjective 'flavor'.

(192) In de wisselwerking tussen actie en reactie bouwt het kind zijn gedragingen op; gewoonten worden gevormd, het leert zijn doen en laten te richten […]. De oriënteringsdrang is in deze levensperiode zeer essentieel; wordt deze te zeer afgeremd, dan kan dit op allerlei gebieden nadelige gevolgen hebben.
'In the interaction between action and reaction, the child constructs its behavior; habits are formed, it learns to orient its behavior. The urge for orientation is very essential in this period of life; if it is inhibited too much, this may/can have negative consequences in several respects.'

(193) Ein ganz neues Feld eröffnet sich der Theorie der Sternentwicklung, wenn man die Entwicklungsgeschichte von engen Doppelsternen studiert. Hier kann es zu einem Masseaustausch zwischen den beiden Partnern kommen, was viele — auf den ersten Blick paradox erscheinende — Eigenschaften dieser Doppelsterne erklärt.
'For the theory of star development, a completely new field is opened up if one studies the developmental history of close double stars. It may/can come to an exchange of mass between the two partners, which explains many — at first sight seemingly paradoxical — properties of these double stars.'

On the other hand, a subjective evaluation is suggested in (194), from a Dutch interview with Catholic clergymen and -women on how they feel about serving in the church (another example from the same interview is (179) above), or in German (195).

(194) maar ik moet wel zeggen dat leven onder gelofte een andere invulling krijgt, naargelang men in de twintig, dertig, veertig, of ouder wordt. en ik heb het ervaren tot nu toe als een dynamisch gebeuren, wat wil zeggen dat het dus kan veranderen.
'but I must say that living under the vow gets a different meaning depending on whether one is in one's twenties, thirties, forties, or is getting older. and I have experienced this so far as a dynamic process, which means, thus, that it can/may change.'

(195) ich bin der meinung daß also einige junge sänger und sängerinnen in deutschland noch gibt die also diese promotion für sich auch sehr nützlich finden könnten.
'it's my opinion that there are some young singers in germany who could/might find this promotion also very useful for themselves.'

Both Lyons' argument and the corpus observations indicate, however, that this (inter)subjective meaning element is not inherent in the modal as such, but only arises due to contextual conditions: a scientific context which implies that the evaluation is based on objective research accessible to everyone vs. a strictly personal context which suggests that the evaluation is entirely a matter of the speaker alone. Not surprisingly, then, the large majority of modals in the corpus appears perfectly neutral in terms of (inter)subjectivity. The situation of the modal is thus perfectly comparable to that of the adverb, which is also evidentially neutral (cf. Section 2.2).

This is true for the modal in its basic syntactic pattern, but the situation in the complementing pattern in (175) is less clear. Since the standard adjectival expression of the type *it is probable that* …. does trigger intersubjectivity by virtue of the nature of its syntactic pattern (cf. Section 2.2), one might expect the same for the structurally similar complementing modal. Yet there is a difference in how the verb *be* and the modal expression relate. The adjective is 'categorically asserted' by the copula *be*, probably a critical element in lending it an intersubjective character. But in pattern (175) the modal modifies existential *be*. The corpus information is inconclusive.

The number of instances is small (even if we include the 4 Dutch variants of the complementing pattern without *zijn* 'be' — cf. Section 4.1), so the following observations may be accidental. Still, on the one hand, nearly all instances occur in the spoken and not in the written data. Specifically, there are no cases in popular scientific texts, although that would be where to expect them if they were intersubjective (cf. Section 2.2). On the other hand, there are no instances in a clearly subjective context. Quite a few of them do relate to positions already introduced in the discourse (often antithetic cases — see Section 4.5 below), or to explicitly stated premises which allow the hearer to draw the same conclusion, i.e. cases which somehow involve shared information. Examples are (176) and (177) in Section 4.1 above. In the former the speaker offers an obvious premise, viz. the existence of bank withdrawals. In the latter, the possibility that violence in movies may have a bad effect on viewers has been discussed at length in the foregoing discourse. Another example is (196), in which a forester answers a question, viz. why despite the self-cleaning capacity of rivers and creeks it is important to actively maintain them, by building an argument obvious to everyone.

(196) auch wenn zu viel vegetation am bach ischt kann sein daß viel nachteiliges schwemmselmaterial im gebüsch hängenbleibt und daß das wiederum schädlich ischt für die selbschtreinigung.
'also when too much vegetation occurs near the river it may be that much disadvantageous floating material gets stuck in the bushes and that this is again harmful for the self-cleaning.'

Also consider what happens if the 'objecting test' (cf. Section 2.2 — recall that this is a fairly weak test) is applied to an expression epistemically modalized by means of a modal, as in (197) and (198) (English, Dutch and German are alike in this respect).

(197) A: They might have run out of fuel.
B: ?Who says so?
B′: Do you think so?

(198) A: It might be that they have run out of fuel.
B: Who says so?
B′: Do you think so?

The non-complementing modal in (197) behaves exactly as the adverbs: reaction B′ is more obvious than reaction B, which only seems interpretable as an ironic response meaning something like ‘you cannot seriously believe that’. Thus, in this pattern it is hard to avoid questioning the speaker directly, which is in line with the assumption that this form does not involve an additional evidential marking, and certainly not an intersubjective one. (See Section 2.2 for detailed argumentation.) In the complementing pattern in (198) the situation is less clear, though: B′ is perfect, but, to the extent that this allows intuitive evaluation, B does not necessarily seem ironic as a reaction.

In summary, though the epistemic modal as such is evidentially neutral, it is not to be excluded that the complementing pattern is tending towards an intersubjective meaning, which is then due to the syntactic nature of that pattern, of course, and not to the lexical semantics of the modal. This requires further investigation, on the basis of a much larger number of complementing instances.

4.3 Performativity

As mentioned in Section 4.1, unlike the other predicative epistemic expression types (the adjective and the mental state predicate), the epistemic modal normally does not allow changes in tense and has no tie to the subject of its clause. Consequently, it cannot be altered from a present to a non-present reading, or from a first person to a third person reading, in order to allow a descriptive use.

It is unclear whether this is different for English *may*. Palmer (1979: 51ff) and Coates (1983: 147ff) suggest that *might* is sometimes used as a past variant of *may*. But as Coates (1983: 155) indicates, in her data such cases basically occur in reported speech only, hence are the result of the ‘sequence of tenses’ rule. However, one can argue that the past is then not a tense marker but a marker of quotative evidentiality, comparable to the occasional use of the Konjunktiv I in German in such cases (see Section 4.1e). Moreover, it is even impossible to know whether the original speaker has not used *might* as a normal present tense (or tenseless) epistemic modal, a problem which also exists in the use of Konjunktiv II forms in these conditions in German. So whether real past, descriptive epistemic uses

of *might* are possible in English is far from clear, but if they are, this is surely marginal. Obviously, *might* used to be the past of *may*, but the past tense has been entirely reinterpreted as an 'epistemic past', i.e. a weakener of the epistemic qualification.

German *können* does not allow such an epistemic use of the past, but for Dutch *kunnen* the situation is less obvious (recall that there are epistemic pasts of Dutch *denken* 'think', but not of German *glauben* 'believe' — cf. Section 3.3). It is clearly impossible in simple cases such as *Jan kon ziek zijn* 'John could be ill', which can only be dynamic. But some native speakers appear to accept it when the modal is joined by modal particles (not translatable into English) supporting an epistemic reading, as in *Jan kon wel eens ziek zijn* 'John might be ill'. Hence, although such cases do not occur in the data, and though my own intuitions are very reluctant to accept this, maybe there is a trend to introduce an epistemic use of the past on the modal in Dutch, exactly as in English. To repeat, however, such pasts are performative, not descriptive.

Obviously, quite like the adverbs, the Dutch and German modals can be used in direct or indirect speech reports. Specifically in newspaper articles such uses are even very frequent (in German even more than in Dutch), much more so than with the adverbs, for reasons which are not apparent to me. But, as argued with respect to the adverbs (cf. Section 2.3), such uses can be considered 'half-performative'. In the direct speech cases the speaker essentially 're-performs' the epistemic evaluation for the original speaker. And in the indirect speech cases there is an implication, clearly present in the majority of corpus cases, that the present speaker also subscribes to, or is at least not disagreeing with, the evaluation by the reported speaker.

The question is whether the impossibility to use the modal descriptively also applies in the complementing pattern. After all, the modal then acquires freedom from the expression of the state of affairs, hence should in principle not be hampered anymore in using tense or the subject for its own sake (cf. Section 4.1). The corpus offers no evidence to this effect. Unlike the predicative adjective, the complementing modal can certainly not take a first or third person subject instead of the deictic or impersonal one. But intuitions are again too weak to decide whether tense variants are possible. One can imagine the patterns in (199) to occur in narrative 'erlebte Rede' contexts, but in that case the past tense is used as an irrealis marker (cf. the

discussion of example (26) in Section 2.3). But apart from that highly marked context, it is unclear whether one would ever use these patterns at all (whence the question marks in (199)), and if one does, whether they can be interpreted as describing a past epistemic evaluation, or should rather be taken dynamically. The latter is definitely true if in the Dutch variants *zijn* 'be' is omitted. The interpretation of the past as a (performative) weakener of the epistemic evaluation in the Dutch cases is subject to the same remarks as discussed above. For English the question is again whether the epistemic modal can be read as a past tense at all. This seems doubtful.

(199) a. ?Het kon zijn dat ze zonder benzine gevallen waren
?Es konnte sein, daß ihnen der Sprit ausgegangen war
'It might be that they had run out of fuel'
b. ?Dat kon zijn
?Das konnte sein
'That might be'

A look at the behavioral features correlated with the potential for a descriptive use of epistemic expressions (cf. Section 2.3) confirms that there are no descriptive uses in the basic pattern, but leaves a possibility for them in the complementing pattern.

a. *Questioning*
In English, epistemic modals do not occur in questions (cf. Coates 1983: 242–243). Exactly the same applies in Dutch and German: there are no cases in the data with a modal allowing an epistemic reading in a question. Also intuitively such cases are impossible (pace De Schutter and van Hauwermeiren 1983: 166), at least in the basic pattern: (200) only allows a dynamic reading. This is true despite the use of the present perfect, which should favor an epistemic reading (cf. Section 4.1e; note again that the alternative forms *zijn ze zonder benzine kunnen vallen?* or *hat ihnen der Sprit ausgehen können?* sound very weird.)

(200) Kunnen ze zonder benzine gevallen zijn?
Kann ihnen der Sprit ausgegangen sein?
'Could/*may they have run out of fuel?'

For the complementing pattern intuitions are once more too weak to warrant a categorical judgment. There is nothing formally wrong with the pattern in

(201), but it somehow ‘feels unusual’, especially in Dutch. If it can be used, it is unclear whether it can be interpreted epistemically.[16] Again, the Dutch variant without *zijn* (which sounds better) is no doubt uniquely dynamic. And the English translation with *may* is clearly impossible.

(201) ?Kan het zijn dat ze zonder benzine gevallen zijn?
(?)Kann es sein, daß ihnen der Sprit ausgegangen ist?
‘May it be that they have run out of fuel?’

There are also no cases in the data in which the epistemic modal occurs in a question without it being the questioned constituent, comparable to such uses of the adverbs and the parenthetical mental state predicates (which then actually serve as speech act modifiers, used performatively, as argued in Sections 2.3a and 3.3a). Maybe the epistemic use of the modals is not sufficiently established in itself to allow such ‘derived uses’ (yet).

b. *Conditionals*

It appears impossible to use the modal in its basic pattern epistemically in the protasis of a conditional, to describe a hypothetical qualification. There are no such corpus cases, neither in Dutch nor in German. (The modal does occur frequently in the apodosis, as in (178), (179), (185), (186), (187), (192) and (196) above, but that is a performative context.) And also intuitively such cases are out of the question: the modal in (202) can only receive a dynamic reading. For the complementing pattern intuitions are once more unreliable (there are no corpus cases): for (203), the same remarks apply as for (201) or (199). The English translation is clearly impossible.

(202) Als ze zonder benzine kunnen zitten stuur ik een tankwagen achterna
Wenn ihnen der Sprit ausgegangen sein kann, schicke ich einen Tankwagen nach
‘If they can/*may have run out of fuel, I’ll send a tanker after them’

16. If one confronts Dutch and German native speakers with cases such as in (201) or (199), or other similar ones to follow, as I have done, one consistently obtains inconsistent results. It is, of course, difficult to solicit reliable judgments of this kind anyway, given the subtlety of the matter (judging acceptability in combination with subtle meaning differences).

(203) ?Als het kan zijn dat ze zonder benzine zitten stuur ik een tankwagen achterna
?Wenn es sein kann, daß ihnen der Sprit ausgegangen ist, schicke ich einen Tankwagen nach
'If it may be that they have run out of fuel, I'll send a tanker after them'

c. *Causality*

In view of its inability to be used descriptively, one would expect the modal in its basic pattern to enforce a reading of (204) in which the cause ascription is the speaker's, exactly as with the adverb. Yet (204) sounds very awkward, if not downright impossible. Also a reading in which the causal clause describes Peter's own reason for drinking another schnaps seems excluded, though.

(204) ??Peter drinkt nog een borrel, omdat hij verslaafd kan zijn
??Peter trinkt noch einen Schnaps, weil er süchtig sein kann
'Peter drinks another schnaps, because he may be addicted'

Why (204) is unacceptable is unclear to me. But at least, it offers no obvious reason to doubt that the non-complementing modal cannot be used descriptively.

Using complementing *kunnen* or *können* in the causal clause, as in (205), appears somewhat better, though it is again unclear whether anyone would ever say this. But if so, then the interpretation seems to be that this involves Peter's reasons for drinking another schnaps, and not the speaker's. If this is correct, then this would be an indication that in this pattern at least, the modal does allow a descriptive use.

(205) ?Peter drinkt nog een borrel, omdat het kan zijn dat hij verslaafd is
?Peter trinkt noch einen Schnaps, weil es sein kann, daß er süchtig ist
'Peter drinks another schnaps, because it may be that he is addicted'

Quite apart from all the foregoing, there is some literature on whether modals can be considered performative verbs in the speech act sense (cf. Boyd and Thorne 1969; R. Lakoff 1972; Calbert 1975; Wunderlich 1981; as stressed in Section 1.4b, this should not be confused with the present notion of performativity). This may be a pertinent question for the deontic uses of

the modals, but it is clearly irrelevant for the epistemic uses, despite claims to the contrary, for example by Brünner (1981). E.g., Van Belle (1973) offers a list of syntactic arguments why the deontic uses can, but the epistemic ones cannot be brought to bear on the issue of speech act performativity. This illustrates the dangers inherent in attempts to treat the epistemic and deontic uses of the modals as variants of one and the same basic sense (see Section 4.1c).

4.4 Information structure

Comparable to what we have seen in the previous chapters, one might expect the basic and the complementing uses of the modals to differ in whether they allow focal expression of the epistemic qualification. No doubt, the dependent status of grammatical markers makes them formally unsuited for focalization (see also Heine 1993: 110). Surely, grammatical dependency is a relative notion (cf. Section 4.1b): the modal still has full morphological independence, even in the basic pattern. But since it **is** syntactically dependent, the question is whether this changes much. Especially in view of our observations about the adverbs and parenthetical mental state predicates, then, one would not expect this form to be used when the epistemic qualification is salient.[17] On the other hand, the complementing modals are not really grammatically dependent anymore, hence they might be expected to allow focalization of the epistemic qualification, in view of their syntactic similarity to the complementing mental state predicates and the adjectives. It is not predictable, of course, whether they will be more like the latter, which are predominantly used under focal conditions, or more like the former, which are hardly ever used focally.

In the following, the category of complementing cases will not only include all instances of type (175), but also German ambiguous case (178) above with an additional adverbial element, and the 4 Dutch cases lacking

17. This expectation would actually not be borne out for the modals in their dynamic reading: intuitively they can be used focally; and see Section 5.4d. The question is whether the presumed difference in degree of grammaticalization between the dynamic and epistemic modals (cf. Section 4.1b) could account for any such information-structural difference. Maybe, the semantics of epistemic vs. dynamic modality as such is more important (see Section 6.5).

the ‘main’ verb *zijn* (cf. Section 4.1). Hence there are 10 spoken and 1 written German cases, and 6 spoken and 1 written Dutch cases. Instances with a non-verbal predicate such as (179)–(182) are not included. Most of them have no complement structure at all, and if they do, not the modal but the non-verbal predicate is the core element of the main clause. That is, there is no longer a situation with the modal as the epistemic expression constituting the main clause and the expression of the state of affairs figuring as its complement.

The corpus data reveal no real difference between the basic and the complementing uses of the modal, however. In the basic pattern it is, as expected, without exception used in non-focal conditions. But, even more drastically than for the complementing mental state predicates, there are no clear instances of a focal use of the complementing modal either. Here are some relevant corpus observations.

a. *Negation*

There is not a single corpus case of epistemically used *kunnen* or *können* in the basic pattern with negation in the clause. Whenever they combine with negation, they have either a dynamic or a deontic meaning. And this seems unavoidable (pace Palmer 1997): in (206) the modal only appears to allow a dynamic reading (again despite the present perfect — cf. Section 4.1e), viz. ‘the situation does not allow for them to have run out of fuel’, e.g. because they started off with a full tank and did not have to drive very far, i.e. observed physical impossibility. (206) cannot mean ‘they have certainly not run out of fuel’. Surely, one can infer that a speaker stating (206) will also hold this epistemic stance. But nevertheless, the latter is not what is expressed by (206), i.e. it is not an ambiguous case.

(206) Ze kunnen niet zonder benzine gevallen zijn
Ihnen kann der Sprit nicht ausgegangen sein
‘They cannot have run out of fuel’

(It is then obviously also impossible to negate these modals, i.e. to express the meaning ‘not [may (be) [they have run out of fuel]]’. Cf. Section 2.4l.)

In Dutch, some native speakers do consider an epistemic reading possible in a case such as *ze kunnen (wel eens) niet thuis zijn* ‘they may (modal particles) not be home’, especially when the particles, which support an epistemic reading, are present. The meaning would then not be ‘certainly

not', however, but 'maybe not'.[18] But *niet thuis* 'absent from home' is a fully idiomaticized expression in Dutch, so *niet* is not a polarity marker here, but is part of the lexical item *niet thuis*. In fact, it is not stressed, unlike the negative polar marker. Also note that the particle group *wel eens* implies a positive evaluation, which would clash with a negative polar marker. But, again, I have not found any corpus instances of this.

There are corpus cases with the complementing pattern involving negation, yet only in the embedded clause. This is exactly opposite to what we have found for the adjectives. There are 2 instances in the German spoken data, i.e. 18.2% of the German complementing cases, including (207). There are no cases in the Dutch data, but that seems accidental, since (207) is perfectly imaginable in Dutch as well. In view of the small number of complementing instances, it is hard to evaluate the representativity of this quantitative information, yet it appears more comparable to that of the adverbs and mental state predicates than to that of the adjectives.

(207) es kann sein daß sich ein streit nur um diesen punkt nicht lohnt und daß ich ihn deshalb verschweige […].
'it may be that a quarrel only over this matter isn't worth it and that I therefore do not mention it.'

Qualitatively, these cases are perfectly comparable to the complementing mental state predicates with embedded clause negation (cf. Section 3.4a): in both, only the negative element, but not the scalar dimension expressed by the modal, contrasts with the foregoing discourse. In (207) there is a contrast between the preceding claim that partners should talk openly about their interests, and the present statement that quarreling over details is **not** worth it. The scalar dimension does not participate in this. The other instance, (208), is self-evident. Particularly significant in the latter is the fact that the speaker does not use a negative reduced pattern but a complementing structure in which the only element in the complement is the negative

18. The relationship between negation and the modals in their different meanings, and specifically the question of how to understand the scope relationships between them, is a notoriously difficult problem. Palmer (1995, 1997), e.g., offers an analysis, with which I do not entirely agree (see also Nuyts 2000c), but discussion of this matter is for another occasion.

particle.[19] In fact, (s)he cannot use a reduced pattern: *es kann auch nicht sein* ‘it may also not be’ is unacceptable (cf. also (210) below).

(208) ja es ging noch darum daß sie wenn möglich […] ihre interessen abklären und zu einem konsens kommen. ob das möglich ist das wäre für mich auch interessant, nich. […] es kann ja auch sein daß nich, und dann müßten wir das auch feststellen […].
‘you should also if possible clarify your concerns and come to a consensus. whether that is possible would also be interesting for me, right. it may also be that not, and then we would have to note that too.’

There is also one complementing case in the German spoken data with an explicit positive polar marker (not translatable in English), viz. (209), which again occurs in the embedded clause. Here, too, the polar element is salient because it contrasts with the from the speaker’s perspective present situation. But the scalar component expressed by the modal is not part of this contrast. This case is thus perfectly comparable to combinations of an adverb with a positive polar marker discussed in Section 2.4e.

(209) aber es könnte sein daß er eines guten tages […] doch unzufrieden is.
‘but it might be that one day he does get dissatisfied.’

The absence of corpus cases with negation in the main clause of the complementing pattern is probably no accident. (210a) appears problematic. If it is possible at all, one would be inclined to read the modal deontically, but then it is difficult to make sense of this expression. Omitting the predicate *zijn* in this pattern in Dutch, as in (210b), imposes a dynamic reading. And negation in a reduced pattern, as in (210c), unavoidably leads to a deontic reading (and see also the discussion of (208) above).

(210) a. ??Het kan niet zijn dat ze zonder benzine gevallen zijn
??Es kann nicht sein, daß ihnen der Sprit ausgegangen ist
‘It may not be that they have run out of fuel’

19. In the parallel pattern in Dutch (of which I have no corpus cases, though), one again uses the complementizer *van* instead of *dat*, i.e. *het kan zijn van niet* ‘it may be of [i.e. that] not’, as in the comparable pattern with a mental state predicate (cf. (117) in Section 3.4a).

b. Het kan niet dat ze zonder benzine gevallen zijn
‘It cannot be that they have run out of fuel’
c. Dat kan niet zijn
Das kann nicht sein
‘That cannot be [i.e., that is intolerable]’

Clearly, then, the only way to express a negative or explicitly positive polar epistemic evaluation over a state of affairs by means of these modals is in a complementing pattern with the negative or positive polar marker in the embedded clause, i.e. as far removed from the modal as possible. These modals’ intolerance for negation in their own clause is comparable only to the impossibility of negative parenthetical mental state predicates and the non-existence of negative adverbs (cf. Sections 3.4a and 2.4m). In fact, neither German, nor Dutch nor English has inherently negative epistemic modals either. Each of these languages does have a modal which in principle only occurs in negative contexts, i.e. what is called a ‘negative polarity item’, viz. *hoeven*, *brauchen*, and *need*. But these forms have no epistemic uses (pace Palmer 1997): they are predominantly deontic, and secondarily dynamic. Thus, *he need not have done it* is not an expression of the speaker’s estimation of the likelihood that he has done it. It is, e.g., not equivalent to *it isn’t/I am not certain that he has done it*, or *maybe he hasn’t done it*, even if these can be inferred from the *need not* utterance. Rather, it means ‘there is nothing in the physical circumstances which makes it inherently necessary for him to have done it’. That is, it does not express lack of certainty (an epistemic notion), but lack of (inherent) necessity (a dynamic notion). The dislike of *kunnen* and *können* for negation in the same clause may be explained in the same vein as the absence of negative forms, then, viz. as a radical effect of their informational status. The clash between the non-focal modal element and a heavily focal polar marker when they occur closely together is too sharp to be acceptable (normally, in Dutch and German, when the modal is the finite verb, the negative particle occurs immediately next to it).

One may object that the adverbs do accept negation in their clause and occur immediately next to it, although they are inherently non-focal too. Maybe the difference is due to the fact that a polar marker has a closer syntactic tie to the predicate (in principle, it directly affects the predicate) than to an adverb which is equally ‘detached’ in the clause as the negative particle itself. On the other hand, not all epistemic and evidential modals in

Dutch and German are equally intolerant towards negation in their clause, although the relative position of the negative particle and the modal is the same in all. For example, while *moeten* and *müssen* are, *zullen* and *werden* are not: *ze zullen (wel) niet slapen vannacht* or *sie werden (wohl) nicht schlafen heute nacht* 'they will not sleep tonight' are fine. According to Coates (1983: 237f), English even hardly limits the combinability of epistemic and evidential modals with negation in the clause at all: even *may* and *might* allow it. The only clear exception is *must*, which can only be deontic when combined with negation. Why there should be such a difference between individual modals, then, is unclear.

The difference does not imply that these more tolerant modals do allow a focal use, however, no more than the co-occurrence of adverbs and negation in one clause implies that the former can be used focally. Thus, English modals normally allow suffixation of a contracted negative. (This does not exist in Dutch or German.) However, although this is in need of a careful corpus-based investigation, at first sight the epistemic or inferential uses do not seem to like this sort of negative incorporation. *Mayn't* does not exist, and *mightn't* sounds highly marked. And in modals which do regularly feature the form, it is questionable whether it normally occurs in epistemic or inferential uses. Neither *couldn't* nor *won't* seem to easily allow an epistemic reading. Coates (1983: 238) suggests that *won't* does, but the problem is that she does not distinguish between future and epistemic uses of this form (cf. Section 4.1a). Coates (1983: 238) also suggests that *oughtn't* and *shouldn't* can get an inferential reading, but only when used in the pattern 'it shouldn't/oughtn't be X'. But for *shouldn't*, I find it hard to imagine such a reading, e.g. in *it shouldn't be John*. And in other patterns it is definitely impossible: *John shouldn't be home* only allows a deontic reading. And regarding *oughtn't*, Coates (1983: 76) reports that negation with *ought* in her corpus results in 100% of the cases in a deontic reading. If all of this is correct, this can easily be explained on the assumption that the English epistemic modals are non-focal, too.

b. *Reduced forms*

There are 3 German and 3 Dutch reduced complementing cases (one Dutch case is a near repetition — cf. (211)), i.e. 27.3% and 42.9% of the complementing cases, respectively. That is even more than for the reduced adjectival cases (cf. Section 2.4b), but the small number of instances is potentially

biasing, of course. One Dutch and one German case may possibly involve some kind of contrast, and will be discussed in (c) below. All other cases are like the absolutive uses of the adverbs, however (cf. Section 2.4f), i.e. non-focal.

Thus, in (211), containing two cases, A starts by challenging a remark by B (the talk show moderator) that in the Dutch-speaking part of Belgium people have the impression that in the French-speaking part one is not really willing to learn Dutch.

(211) A: wat u zegt, dat feit is 10 jaar oud! B: ja, dat kan zijn. C: jaja. B: dat kan zijn, hoor. C: ja. B: maar, het feit juist dat uw centrum [for promoting Dutch studies in Wallonia] bestaat is toch ook een voorbeeld ervan?!
'A: what you are saying, that fact is 10 years old. B: yes, that may be. C: yesyes. B: that may be, sure. C: yes. B: but the fact that your center exists is also an example of it, isn't it.'

Clearly, B does no more than admit that A is possibly right, the modals do not add salient new information. Similarly in German (212), from a conversation in which A criticizes the behavior of the mother of a fellow who brought his girlfriend home for the first time, while B attempts to defend the mother, and (213), from a conversation about whether one should censor violence in movies (the relevant case is spoken by B). Each time the modal is used to confirm or, in (213), slightly relativize the previous statement, but adds nothing new.

(212) A: und daß sie einfach […] gegen den status des schwiegermutterseins überhaupt […] dagegen ist […]. B: na ja es gibt ja aber auch die möglichkeit daß dieses mädchen wirklich nicht so furchtbar nett is. A: ja das kann natürlich sein aber was macht diese dem mädchen zum vorwurf, daß es still in der ecke saß […].
'A: and that she is simply against the status of being mother-in-law. B: yes but there is also the possibility that this girl really is not very nice. A: yes that may obviously be but what does she reproach the girl, that she sat quietly in the corner.'

(213) A: glaub schon daß man damit im grunde genommen auch nichts erreichen […] könnte. B: würd ich auch sagen. A: denn es is halt die form die hier in unsrer gsellschaft […] einfach vertreten is un […] es hat natürlich auch so ne funktion wie ne abfuhr von

aggressionen. B: ja. A: das ist ganz sicherlich. B: kann sein. A: kann man bei sich selber ja auch beobachten.
'A: I do believe one essentially could not achieve anything with it either. B: I would say so too. A: for it is simply the form which is represented in our society and it obviously also has kind of a function like the drainage of aggressions. B: yes. A: that is very obviously [sic]. B: may be. A: one can observe that also with oneself.'

c. *Contrast*
There are no corpus instances at all in which the epistemic modal, basic or complementing, is used in a structurally contrastive way, i.e. involving an explicit contrast of two alternative qualifications in one utterance. Intuitively such uses also appear impossible. Neither (214a) nor (214b), in which modals in the basic pattern are contrasted clause-internally and in adjoined clauses, are acceptable. And even in a complementing pattern contrast appears highly unlikely in adjoined clauses and impossible clause-internally, as shown in (215).

(214) a. *Zij kunnen niet alleen, maar zullen wel zonder benzine gevallen zijn
*Ihnen kann nicht nur, sondern wird der Sprit ausgegangen sein
'They may not only, but will have run out of fuel'
b. *Zij kunnen niet alleen zonder benzine gevallen zijn, dat zal zelfs zo zijn
*Ihnen kann nicht nur der Sprit ausgegangen sein, das wird sogar so sein
'They may not only have run out of fuel, this will even be so'

(215) a. *Het kan niet alleen maar zal zelfs zijn dat ze zonder benzine zitten
*Es kann nicht nur sondern wird sogar sein, daß ihnen der Sprit ausgegangen ist
'It may not only but will even be that they have run out of fuel'
b. ??Het kan niet alleen zijn dat ze zonder benzine zitten, het zal zelfs zo zijn
??Es kann nicht nur sein, daß ihnen der Sprit ausgegangen ist, es wird sogar so sein

‘It may not only be that they have run out of fuel, this will even be so’

Some of these expressions may seem better acceptable when *zullen* and *werden* are replaced by *moeten* and *müssen* ‘must’, but intuitively, this unavoidably leads to a dynamic reading of both modals, i.e. a contrast between inherent possibility and inherent necessity. In fact, there are a few such contrasts in the German (but not in the Dutch) data, but they are either dynamic or deontic (a deontic reading would obviously not make any sense in (214) and (215)). None is epistemic. The fact that a contrast with *zullen* and *werden* (and *will*), which have no dynamic reading, is impossible is significant in this respect.

There are two corpus cases, both with a reduced pattern, which may involve a contrast with elements in the immediately preceding context. One case, (216) (i.e. (183) with additional context), is extremely weak, though. This example is comparable to the ‘contrastive’ cases with a mental state predicate in (132)–(133) in Section 3.4c. The tendency towards a positive answer is mildly opposed to the agnostic expression preceding it. But this can hardly be considered a case of contrastive focus, the more since the positive answer actually takes up a possible (even if maybe not intended) suggestion in A’s question.

(216) A: hoe doet u ’t zelf? kleedt u zich […] in ’n bepaalde mode of heeft u ’n B: ’k weet niet of dit ’n bepaalde mode is. […] het zou wel kunnen.
‘A: how do you do this yourself? do you dress in a certain fashion or do you have a B: I don’t know whether this is a certain fashion. it could/might be.’

Of a completely different nature is German spoken case (217). The speaker is discussing conflicting statements in the work of Basil Bernstein. Obviously, there is a contrast between ‘is the case’ (unqualified certainty) and ‘might be the case’, and *is* and *könnte* are stressed. But this does not involve two expressions ‘productively created’ by the present speaker. Rather, (s)he cites two epistemic statements made by one person at different points in time, completely drawn out of their original context and syntactic embedding, but probably each one non-contrastive when originally produced. And (s)he now opposes them to show the contradiction. This is, in other words, a case of

'metatalk', perfectly comparable to cases of stressing in echo utterances discussed in Section 2.4. In such contexts anything can be stressed by a speaker, but this cannot be used as a case showing that in default language use the epistemic modal can be used in conditions of contrastive focus.

(217) der coulthard hat ja auch so […] einzelne unterschiede bei verschiedenen versionen von bernstein aufgezeigt […] in der […] definition von zweiundsechzig sagt er, i:s ein beispiel dafür, […] sechsundsechzig sagt er, kö:nnte sein.
'coulthard also showed isolated differences in different versions by bernstein, in the definition of sixty-two he says, is an example of it, sixty-six he says, might be.'

d. *Qualification of backgrounded embedded clauses*
A very considerable number of modals in their basic pattern occurs in backgrounded embedded clauses, predominantly relative clauses and a few adverbial and parenthetically inserted subclauses (complement clauses have not been included for reasons discussed in Section 2.4g). There are 27 Dutch and 30 German cases, i.e. 23.9% and 18.1%. This is much more even than for the adverbs (8.3% in Dutch and 8.2% in German). Examples are (218) and (219). The latter concludes an article on the relationship between earthquakes and the formation of quartz, so the question how earthquakes can be caused has been the topic all through. There are no complementing cases in such contexts.

(218) d'er zijn toch bepaalde actrices, ik weet nu niet, ik kan verkeerd zijn, maar als ik denk aan greta garbo, bijvoorbeeld, zij had toch, was het niet ernst lubitsch, als regisseur?
'there are certain actresses, I don't know, I can/may be wrong, but if I think of greta garbo, for example, she had, wasn't it ernst lubitsch, as director?'

(219) Mit der Umwandlung [from stischovit into quartz] wären dann jedesmal schwere Erschütterungen der äußeren Schichten des Erdmantels und der Erdkruste verbunden, die zu Erdbeben führen können.
'The transformation would each time be accompanied by heavy shakings of the outer layers of the earth's mantle and crust, which can/may lead to earthquakes.

Unlike for the adverbs and mental state predicates, there are no cases in which the modal qualifies a backgrounded constituent only (instead of an entire clause), but that is not surprising since such a combination is syntactically impossible.

e. *Questioning*

As discussed in Section 4.3a, the epistemic modals do not allow questioning, quite clearly not in the basic pattern, and apparently not in the complementing pattern either. Since questioning also means focusing, this is another indication that the modals defy focalization.

f. *Rejecting an epistemically modalized utterance*

Also the test of interactive questioning of an utterance with an epistemic modal indicates that the modal is not normally part of the focal information in the utterance. Both in (220) and (221), with the modal in the basic and the complementing pattern respectively, the normal interpretation of B seems to be that it rejects the assumption that 'they have run out of fuel', and not the epistemic evaluation of the state of affairs. Thus, B can easily continue: *they have had an engine problem*, but hardly: *it's absolutely improbable that they have*. Assuming that a question such as B affects the focal information in the foregoing utterance, this suggests that the state of affairs, not the epistemic evaluation of it, is normally considered focal in A. Interestingly, if in (220) one reads the Dutch or German modal dynamically instead of epistemically, the reaction **does** affect the dynamic qualification: it then means 'no, that possibility does not exist', hence B could continue: *they filled up their fuel tank before they left*.

(220) A: Ze kunnen zonder benzine gevallen zijn
Ihnen kann der Sprit ausgegangen sein
'They may have run out of fuel'
B: Dat is niet waar
Das stimmt aber gar nicht
'That's not true'

(221) A: Het kan zijn dat ze zonder benzine gevallen zijn
Es kann sein, daß ihnen der Sprit ausgegangen ist
'It may be that they have run out of fuel'

B: Dat is niet waar
Das stimmt aber gar nicht
'That's not true'

In summary, the foregoing features (a)-(f) together offer strong evidence for the assumption that the modals in general, in the basic as well as in the complementing pattern, do not occur in focus, and even do not allow focalization at all. This is remarkable specifically for the complementing form, as its syntax is comparable to that of the modal adjectives and complementing mental state predicates, both of which do allow (and the former even predominantly attracts) focalization. I return to this in Section 6.1.

Finally, a word about stress. According to Coates (1983: 243–244), except for *will*, all epistemically and inferentially used English modals predominantly attract stress, viz. in between 65% and 100% of their occurrences. E.g., 80% of epistemic cases of *may* have stress. To the extent that my corpus data allow interpretation of this, and intuitively, this is definitely not true to the same extent in Dutch and German. Nevertheless, also in these languages one can intonationally highlight an epistemic modal, even if this probably happens fairly rarely. But, presumably, this again does not involve focal stress, but rather the special type of 'qualificational stress' also observed in the other epistemic expression types, including the inherently non-focal adverbs and parenthetical mental state predicates, which serves to further modify the epistemic qualification. See Section 2.4 for discussion.

By the way, the above analyses show that the epistemic modals do not satisfy three of the four NICE-properties (Palmer 1965; Huddleston 1976 — see Section 4.1b): they appear not to like combination with a contracted negative, they cannot undergo inversion in an interrogative as they cannot be questioned, and they cannot carry emphatic (contrastive) stress. Yet otherwise the epistemic modals count as strongly grammaticalized forms. This goes to show how shaky criteria such as the NICE-properties are for assessing degrees of grammaticalization (cf. Section 4.1).

4.5 Discourse strategy

Coates (1983: 134) has observed that one of the most remarkable properties of English epistemic *may* is its frequent use as a hedging device, by means

of which “the speaker avoids committing himself to the truth of the proposition”. This formulation is unfortunate since this is precisely the semantic definition of this epistemic modal: it expresses the speaker’s uncertainty whether the qualified state of affairs is true or not. So, in principle all epistemic uses of *may* have this property. But it is true that this specific meaning of English *may*, and of Dutch and German *kunnen* and *können* alike, can be exploited in discourse for achieving the argumentative purpose of managing antithetical views.

Thus, these modals are sometimes used to indicate that although the speaker does not (want to) or cannot reject a suggestion by the interlocutor, (s)he does not want to endorse it either. The modal then acquires something of a concessive meaning. Often, the purpose is only to avoid threatening the interlocutor’s face (cf. Carretero 1997). In (222), for example, from the written Dutch corpus (we are interested in the second occurrence of *kan*), the author uses the modal to indicate that he does not want to discard Jespersen’s proposal altogether, yet is skeptical about it (this is saving Jespersen’s, rather than the interlocutor’s face).

(222) Deze betekenisverandering kan volgens Jespersen verklaard worden door het feit dat kinderen de uitdrukking ‘to count one’s beads’ onbewust anders gingen analyseren dan hun ouders, de vorige generatie. Deze factor kan een rol gespeeld hebben, maar het is onmogelijk om dit te bewijzen.
‘According to Jespersen, this meaning change can be explained by the fact that children unconsciously started to analyze the expression “to count one”s beads’ differently from their parents, the previous generation. This factor can/may have played a role, but it is impossible to prove this.’

Similarly, in Dutch and German spoken examples (211) and (212), or Dutch written example (182) above, the modal is used to ‘keep at a distance’ information from the conversation partner, which may be true, yet is not relevant or not favorable for the speaker’s argumentation.

However, against Coates’ claim that this type of usage of *may* is very frequent in English, there are only few such cases in the Dutch and German corpora. German *können* is used even more rarely this way than Dutch *kunnen*, but that is probably because in German this function is more typically performed by the epistemic modal *mag* ‘may’, which would intuitively even seem to have this as its prime usage. Like for the mental

state predicates, quantifying the strategic uses is difficult, however, because the boundary between strategic and non-strategic uses is extremely fuzzy.

It is also unlikely that this type of usage is unique for the modals. Obviously, this usage is possible by virtue of the fact that the qualification expressed by this modal is somewhat unspecific yet situated on the epistemic scale near the neutral point of ‘not knowing’. Hence one may wonder whether weak adverbial *misschien* or *vielleicht* ‘maybe’ or adverbial or adjectival *mogelijk* or *möglich(erweise)* ‘possible/possibly’ cannot be used in a similar way, even if they are more specific than the modal. Reactive expressions of the type *yes, possibly/maybe, but* … or, *that is possible, but* …, sound rather familiar. A brief glance at a few corpus instances of these forms reveals that the answer is positive indeed. Consider (223), from a Dutch TV-interview discussing an alleged criticism launched by the American State Department on a new type of passport which was about to be introduced in The Netherlands. According to the Dutch authorities, it is impossible to tamper with these passports, but this has been contested by American experts. The Dutch State Secretary for External Affairs responds to a reporter confronting him with this criticism:

(223) ik kan mij die kritiek nauwelijks voorstellen. ’t is wel mogelijk dat ’t misschien wel kritiek is, maar niet van ’t state department, omdat wij een onderzoek hebben laten verrichten bij ’t instituut van het ministerie van justitie […]
‘I can hardly imagine this criticism. it is possible that it maybe is criticism [sic], but not from the state department, because we have had an investigation carried out by the [American] institute of the department of justice […]’

On the other hand, this strategic usage is not inhered by the entire category of epistemic (and evidential) modals: epistemic *zullen* or *werden* ‘will’, or evidential *moeten* or *müssen* ‘must’, for example, certainly do not have it.[20]

Finally, this type of strategic usage of *kunnen* and *können* (and *may*) obviously cannot be put on a par with the mitigating use of the mental state predicates. There are common features, in the sense that the argumentative use of the modal often also has features of hedging, face-saving, deference, etc., which are central in the mitigating use of the mental state predicates.

20. This does not mean these other modals cannot have other types of strategic uses: Carretero (1997), e.g., argues that they do feature in politeness strategies.

But they are far less prominent in the use of the modal. And the core of the usage of the modal as an argument managing device is entirely absent in the strategic use of the mental state predicates, while the modal cannot be used to achieve the type of purpose to which the mental state predicates are put.

4.6 Summing up

Figure 3 summarizes the findings of the above factor analysis. (For the meaning of the markings in this figure, see Section 2.6. (-) means a slight tendency towards this feature.) As with the mental state predicates, I have not differentiated between the basic and the complementing uses, as they behave essentially in the same way. The only difference concerns the brackets around the negative marks for descriptive uses and intersubjective evidentiality: as we have seen, the complementing form may possibly (tentatively) be developing these features, while the basic form certainly is not. So if we were dealing with the basic form alone, these features would be marked with a simple negative sign.

It turns out that there is not a single factor in terms of which the modal can be said to have a special profile: it is essentially neutral in terms of all of them.

epistemic qualification
(probability of the SoA)

	↙	↓	↓	↘
evidentiality:				
(inter)subjectivity	−	+	++	(−)
performativity:				
descriptive use	−	(+)	+	(−)
information structure:				
focalized use	−	++	(+)	−
discourse strategy:				
mitigation	−	−	+	−
argum. management	+	−	−	+
	↓	↓	↓	↓
	adverb	*adjective*	*ms-predicate*	*auxiliary*

Figure 3. *Factors in the use of epistemic expression types*

So it appears to have exactly the same functional position as the adverb. The two form types do differ, of course, in that the modal shows many signs of instability, i.e. of a form in full development (see also Section 4.7 below), while this is not true for the adverb. One may wonder, then, whether the modals will not develop a functional difference to the adverbs. In their basic, grammaticalized pattern, we have not seen any signs of this, and it would also seem unlikely: after all, one does not expect a grammaticalized form to have special functional features. Such features are rather the realm of the linguistically much more versatile lexical expression types. To the extent that the complementing modal would not seem to participate in the overall increasing grammaticalization of the modals, however, the situation may be different for them. That is precisely what the foregoing analysis suggests.

From a synchronic perspective, then, the question remains what differentiates the modal and the adverb in a speaker's choice of an epistemic expression. The only real semantic difference we have observed is the precision of the epistemic qualification expressed by each: while the adverbs refer to specific positions on the epistemic scale, the modal auxiliaries are much vaguer (possibly because of their higher grammaticalization; see Section 4.1). This may account for the choice between them in some cases. But no doubt there is yet another, and possibly much more important element at work here, of a purely syntactic or grammatical nature. In the West Germanic languages, there are limits on the number of sentence adverbs and on the number of auxiliaries that can be combined in one clause. The ideal would seem to be: no more than one of each. Hence, if a speaker wants to express several semantic (usually qualificational) dimensions which normally require an adverbial or an auxiliary expression form, the availability of both functionally equivalent alternatives allows him/her to avoid an accumulation of adverbs or auxiliaries, and to distribute the load evenly over both linguistic categories.

4.7 Postscript: The diachrony of the Dutch modals

A look at the diachronic development of the epistemic meaning of the modal *kunnen* in Dutch shows that its unstable status in current Dutch should not come as a surprise. There has been little research on the diachrony of the modal auxiliaries in Dutch so far. The only study I am aware of, Duinhoven

(1994), is a purely theoretical, conceptual analysis, not supported by real historical data. So, in order to get an idea of the actual evolution of the epistemic meaning of *kunnen* (and other modals) I have taken a closer look at the data provided in the *Middelnederlandsch Woordenboek* ('Middle Dutch dictionary', Verwijs and Verdam 1885–1929, henceforth MW), and the *Woordenboek der Nederlandsche Taal* ('Dictionary of the Dutch language', De Vries and Te Winkel 1864–1998, henceforth WNT). Both compile considerable numbers of excerpts from the most important sources for Middle Dutch and Modern Dutch, respectively. The WNT also covers the transitional period between Middle and Modern Dutch and complements the MW for Middle Dutch, so the two together provide an excellent overview starting from the early Middle Dutch period. There are hardly any traces left of Old Dutch, hence there is no compilation covering that period. (See also Nuyts 1996b on the following.)

It turns out that *kunnen*, or rather its predecessor *connen*, did not have an epistemic meaning in Middle Dutch yet. According to the MW, the central meaning was already the dynamic one, illustrated in (224) and (225).

(224) (Dat) du di […] ne coens ghehelpen uter noot
'(That) you cannot help yourself out of trouble' [J.van Maerlant, *Spiegel Historiael*, app. 1285]

(225) (So) soudict gaerne doen, const ict
'(Thus) I would like to do it, if I could' [J.van Ruusbroek, mid 14th century]

Another important and clearly related meaning is characterized by the MW as 'to be knowledgeable of something', 'to know how to', and, immediately related to this, 'to have knowledge', 'to know (that)'. Examples are (226) and (227).

(226) In can conste ghene dan hove te winnene allene
'I do not know any art except that of courting' [J.van Maerlant, *Spiegel Historiael*, app. 1285]

(227) Si maecten alle astronomie ende consten alle philosophie
'They created the whole of astronomy and knew everything about philosophy' [Broeder Gheraert, *Natuurkunde van het Geheelal*, 14th century]

In the dynamic reading this predicate seems to have been a modal auxiliary already, since in most entries it supports an infinitive. In the other meaning, however, it nearly always occurs without an infinitive (as in (226) and (227)), suggesting that it was an independent, full verb. In modern standard Dutch this latter use is completely obsolete, but in dialects it is still available in limited contexts, for example when referring to the fact that someone knows a language, e.g., *Jan kan Duits* (literally) 'John can German' (in standard Dutch this is *Jan kent Duits* 'John knows German').

The epistemic meaning of *kunnen*, then, appears to be a very recent development. Among the citations of the modal in this meaning in the WNT, the oldest ones only date back to the 2nd half of the 19th century. (228) and (229) are among them.

(228) Het kan zelfs nog erger zijn geweest. Er kan iets zeer onbetamelijks en laakbaars gebeurd zijn.
'It can/may even have been worse. Something very improper and reprehensible may have happened.' [J. Kneppelhout, *Geschriften*, 1875]

(229) In eene zaal […] zit het feestelijk gezelschap aan tafel; zij kunnen een twintigtal mannen en vrouwen zijn.
'In a hall […] the festive group is sitting at the table; they [i.e. there] may be some twenty men and women.' [M.Rooses, *Geschiedenis der Antwerpsche Schilderschool*, 1879]

The MW does not mention the deontic meaning of *kunnen* either. According to the WNT, the oldest occurrences are from the late 16th century, so this meaning nevertheless developed a few centuries earlier than the epistemic one.

Also in most other modals with an epistemic or evidential meaning this meaning appears to be a very recent acquisition, even if not as extremely as for *kunnen*. Thus, Middle Dutch *moeten* 'must' predominantly had a deontic meaning, which was much wider than at present: it not only included obligation and moral necessity, but also permission, i.e. a meaning now expressed by *mogen* 'may'. And it sometimes also had a dynamic meaning of inherent necessity. The oldest cases with an evidential meaning in the WNT, including (230), date back to the 17th century.

(230) Met sulcke Heeren moet ghy jou ghelt verteeren
'When you hang out with such gentlemen you must spend all

your money (one cannot think otherwise)' [Bredero, *Boertigh Liedt-Boeck*, 1622]

Mogen 'may', in English now the most important epistemic modal, also seems to have had an epistemic meaning for a while, although it has completely disappeared in present Dutch. But again, it did not have this meaning in Middle Dutch yet: it then primarily had a dynamic meaning (completely gone in modern Dutch, too), and it already had an important deontic use. The WNT lists a few occurrences of this modal with an epistemic meaning (comparable to the current epistemic meaning of *kunnen*; cf. also German *mag*) between the 17th and the 19th century, among them (231). (Cf. the fact that a few epistemic adverbs in modern Dutch — *mogelijk* 'possibly' and *misschien* 'maybe' — have developed out of constructions with *mogen*.)

(231) Uit vreese dat ik u daar door mocht mishagen
'Out of fear that this way I might displease you' [J. van Heemskerk, *Batavische Arcadia*, 1637]

Only for *zullen* 'will', 'shall' — *sullen* in Middle Dutch — does the MW list a few epistemic cases, including (232). The most important uses in Middle Dutch were a now completely obsolete deontic one, and the currently predominant one as a future tense marker.

(232) Ic wil thuuswaert gaen spoeden, mijn wijf sel na mi verlanghen
'I want to hurry home, my wife will be longing for me' [*Reinaerts Historie*, 2nd half of the 14th century]

The semantic development of the Dutch modals, then, can be construed as being roughly in line with the cross-linguistic pattern reported in the literature (cf. Section 4.1c). The common assumption is that this development has started from an independent verb, which grammaticalized into an auxiliary and thereby went from a dynamic via a deontic to an epistemic meaning. The tentative pattern for the Dutch modals is presented in (233). (On the meaning of the original independent verb, see the MW; cf. also Van Wijk 1912 and De Vries 1971.)

(233)

	Meaning of indep. verb	Meaning development of modal					
kunnen:	'to have a mental capacity'	>	dyn.	>	deont.	>/+	epist.
mogen:	'to be strong'	>	dyn.	>	deont.	[>/+	epist.]
moeten:	?measure 'determine limits'	>	dyn.	>	deont.	>/+	evid.
zullen:	'to owe something'	>	deont.	>	temp.	>/+	epist.

For most modals, the original, autonomous predicate has nearly completely disappeared in modern Dutch, but for some there is still a trace of it in Middle Dutch (e.g., for *kunnen* — see above). The development of qualificational meanings in the individual modals has clearly been motivated by the meaning of the original verb (i.e. comparable to what happened in the mental state predicates — see Sections 3.1 and 3.3). Thus, the independent predicate *kunnen* meant 'to know (how)', or, in other words, 'having a mental capacity', and independent *mogen* meant 'to have mental and/or bodily strength'. In both, the step towards the dynamic meaning of 'having an ability', 'being able to do something', for both no doubt the first qualificational meaning to be acquired, is very small. Independent *zullen* had the meaning 'to owe someone something', and the step towards the deontic meaning of 'being obliged to do something', no doubt the oldest qualificational meaning of this modal verb, is again small. The precise origins of *moeten* as an independent predicate is not known, but it is often assumed to be related to *meten* 'to measure'. In this case, the step towards the dynamic qualificational meaning (assuming this was the first one to develop) may seem less obvious, yet if one understands measuring as 'determining the borders or limits of something', the link becomes more transparent: to act because of a need puts a limit to one's freedom to decide when to act.

The precise course of the subsequent development of qualificational meanings is not absolutely clear, however. Common wisdom has it that dynamic meanings first develop into deontic ones, and those into epistemic ones. Thus, on the basis of a 'logical' analysis of the meanings of *kunnen*, Duinhoven (1994) suggests that its epistemic meaning has indeed at least in part been derived from the deontic meaning. And on the basis of the timing of the first occurrences of these meanings (see above), this may seem plausible. But on the other hand, if this were true, it is not apparent why in current Dutch the epistemic and dynamic meanings and the deontic and dynamic meanings clearly interact, while there is no interference at all

between the epistemic and deontic meanings of this modal (cf. Section 4.1). The latter strongly suggests a parallel development (even if not in terms of timing) of the deontic and the epistemic meaning out of the dynamic one. (Cf. also Bybee 1988, Bybee et al. 1994 on the development of English *may*.) If so, it is an open question whether the same is true for *mogen* and *moeten* (but compare Gamon 1994 and Nordlinger and Traugott 1997). That the latter should have developed an evidential rather than an epistemic meaning may actually not be accidental either: 'measuring', the meaning of the original independent verb, also involves giving precise data about where the limits are. For *zullen*, the temporal meaning probably developed out of the deontic one first (see Bybee and Pagliuca 1987; Bybee et al. 1991), and the development of the epistemic meaning may have been out of the deontic one or (as Bybee et al. have it) the temporal one.

It turns out, then, that the Dutch modals in general have acquired their epistemic meaning only relatively recently, much more recently than the English modals, for example. And *kunnen* is by far the latest of them all. (It may be no accident that also in English *can* has developed much more slowly than the other modals, in several respects. It has not even developed a truly epistemic meaning, except in its 'past' form *could*. Cf. Goossens 1990.) This fully explains why even at present its use with an epistemic meaning is very unstable and still largely based upon the dynamic meaning. Apparently, it is still too young to have acquired a stable position within the system of epistemic expression types in Dutch.

Chapter 5

Information structure

An experiment

5.1 Aim

One of the most remarkable findings of Chapters 2 till 4 is the status of the epistemic expression types in terms of information structure. The adverbs, the parenthetical mental state predicates and the basic and complementing modals radically defy focalization. The adjectives prefer to be used in focal conditions but rarely occur. And the complementing mental state predicates can be used focally but despite their high frequency hardly ever are. All in all, we have found remarkably few cases of focal uses of epistemic expressions. Clearly, it would be interesting to find out what happens if language users are more systematically 'forced' to use epistemic expressions focally. Would this lead to the same results?

To answer this question, Wietske Vonk and I have performed an experiment which systematically opposes conditions in which the epistemic evaluation is focal vs. non-focal (see Nuyts and Vonk 1999 for an elaborate report). Taking the corpus findings as summarized above as our starting hypotheses, the aim was first of all to see whether these correlations between (non-)focality and form types can be further corroborated. But the aim was also to widen up the perspective towards other epistemic expression types not considered in the corpus study: how important are, e.g., modal particles, term adverbs and adjectives, etc., and if they are significant, what is their information-structural position.

To achieve these goals, we have opted for a method in which subjects are invited to produce epistemic expressions spontaneously, i.e., controlled data elicitation. This should provide us not only with quantitative but also with qualitative data to evaluate the link between conditions of focality vs.

non-focality and expression types. Since the corpus analysis also revealed quite some variation between spoken and written data, the experiment was performed in a spoken and a written version.

5.2 Method, subjects

In normal circumstances, speakers make epistemic evaluations in situations in which they have to reflect on the reality status of a state of affairs, usually because that reality status is unclear. In the experiment, we tried to simulate such a situation by having subjects react to questions regarding short cartoon strips depicting brief and simple stories, which leave sufficient room for alternative interpretations and are therefore likely to cause some degree of uncertainty on the part of the speaker. The conditions of focality vs. non-focality of the epistemic qualification were implemented here as focality on the qualification vs. focality on the state of affairs depicted in the cartoon strip. These were realized, then, by using two different types of cartoon strips, and by varying the types of questions asked about them, in the following way.

A first type of cartoon strip presents a complete short story about a person to whom something happens, but the story leaves open several possibilities as to why this happens (henceforth ‘full story’). The condition of focus on the state of affairs (henceforth S_f — i.e., state of affairs$_{\text{full story}}$) is achieved by asking subjects why the story ends the way it does. The condition of focus on the qualification (henceforth Q_f — i.e., qualification$_{\text{full story}}$) is achieved by presenting subjects an explanation why the story ends the way it does, and by asking their opinion about how good this explanation is. In this way their focus of attention is drawn to the probability of the explanation.

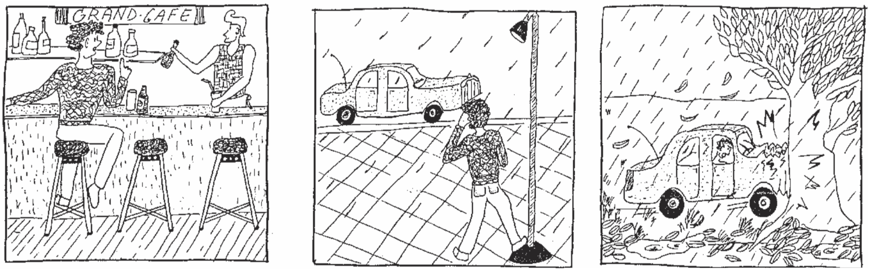
Obviously, the latter type of condition is more complex and less natural than the former. In order to compensate for potential biasing effects from this, we also used a second type of cartoon strip, which reverses the order of markedness for the two conditions. It presents a story about a person who is about to (make a decision to try to) do something, but the outcome is open, and the cartoon strip suggests several factors which favor or disfavor a decision to act or success of the action (henceforth ‘open story’). The condition of focus on the epistemic evaluation (henceforth Q_o — i.e., qualification$_{\text{open story}}$) is achieved by asking subjects what the outcome of the

story will be. This draws their attention to the probability of (the absence of) success or action. Focus on the state of affairs (henceforth S_o — i.e., state of affairs$_{open\ story}$) is realized by telling subjects that the protagonist has (not) achieved his/her goal or has (not) performed the action, and by asking their opinion about why the story should have ended this way. This latter condition is thus more marked than the former, i.e. exactly opposite to the situation for the full stories.

The experiment does not aim to investigate the effect of (the perception of) degrees of likelihood of states of affairs on the role of information structure in the use of epistemic expressions. But we have taken some precautions to avoid potential biases due to this factor. There is unavoidably some variation in the inherent likelihood of cartoon strip stories (some full stories are more likely than others, and some open stories are more likely to lead to success than others). This is difficult to control because there are no objective measures for establishing the likelihood of a story: evaluating this is probably strongly idiosyncratic, due to the personal perception of an individual. But assuming that it **is** possible to make a rough division between likely (L) and unlikely (U) explanations or outcomes of stories, we have systematically alternated these two in the marked types of conditions (abbreviations: Q_fL vs. Q_fU, and S_oL vs. S_oU).

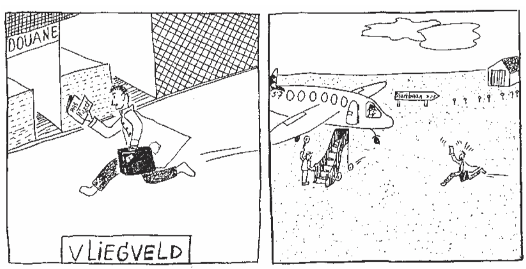
Figures 4 and 5 illustrate the two types of cartoon strips and their conditions. In total, we used 12 different cartoon strip stories, 6 open and 6 full ones (see Appendix 1).

For technical and practical details of the implementation and performance of the experiment I refer to Nuyts and Vonk (1999). Since we wanted to avoid bias from subjects' conscious control of their use of epistemic expressions, they were told that the experiment was about principles of human perception and explanation of reality. In the tasks we obviously had to ask for subjects' opinion about the 'feasibility' of stories and explanations, but in doing so we did not use any epistemic expressions, in order to avoid echoing effects. For the same reason, we presented materials such that task formulation and response were at least separated by a period of observation of the cartoon strip. In the Q_f and S_o conditions presentation of the explanation or outcome of the story increased the lapse between task and response even more. To further hide our real interests, we also asked subjects to motivate or explain their response, even though we are not interested in that part of their answers.



Conditions:
Focus on state of affairs (S_f):
    question: *why does the boy have a car accident?*
Focus on qualification – unlikely condition ($Q_f U$):
    explanation: *the boy has a car accident because the road is slippery*
    question: *what is your opinion about this explanation?*
Focus on qualification – likely condition ($Q_f L$):
    explanation: *the boy has a car accident because he is drunk*
    question: *what is your opinion of this explanation?*

Figure 4. *Example of a Full Story and its conditions*



Conditions:
Focus on qualification (Q_o):
    question: *does Jaap manage to catch the plane?*
Focus on state of affairs – unlikely condition ($S_o U$):
    outcome: *Jaap does manage to catch the plane*
    question: *why does Jaap make it?*
Focus on state of affairs – likely condition ($S_o L$):
    outcome: *Jaap does not manage to catch the plane*
    question: *why does Jaap not make it?*

Figure 5. *Example of an Open Story and its conditions*

There were 63 subjects in the written and 66 subjects in the spoken version of the experiment, all native speakers of Dutch, students at the University of Nijmegen (The Netherlands), aged between 18 and 25.

5.3 Data selection and general information

For full details about the preparation and selection of the data for further analysis, and about the quality of the data, I can again refer to Nuyts and Vonk (1999). Table 8 summarizes the most important quantitative information. For the present purpose, the following points are important.

a. *Answers*
As mentioned in the previous section, subjects were not only asked to give their opinion about the story, the explanation, etc., (the central question of the experiment), but also to further explain or motivate this opinion (meant to hide the central question). Obviously, only subjects' response to the former interests us. Also, subjects sometimes spontaneously produced comments on the drawings of the cartoon strips, or the story, or the questions, or the setting, etc., all irrelevant for our concerns. Hence, within subjects' responses (henceforth 'reactions') we have only retained the parts concerning the central question (henceforth the 'answer') for further analysis.

Even within the category of answers a selection was made, however. We have distinguished between direct and indirect answers. In a direct answer the subject gives a straight response to the central question. In an indirect answer the subject does not respond to the central question straightforwardly, but by means of a statement indirectly implying an opinion regarding the story, explanation, etc. Thus, direct answers to the question in the Q_fL condition in Figure 4 above would be: *in my view that's very probable*, or *I think that's a plausible explanation*. Indirect answers would be: *the weather seems quite terrible, though, don't you think so?*, which implies, but does not make explicit, that the subject does not agree with the explanation offered; or *he seems, in fact, to have been drinking a lot, judging from the first picture*, which implicitly indicates agreement with the explanation. In the analysis we have only considered direct answers, because they are the only type which can straightforwardly be interpreted in view of our initial purpose.

Table 8. *Quantities of direct answers and relevant qualificational expressions (QE)*

		spoken							written						
		S_f	S_oU	S_oL	Q_o	Q_fU	Q_fL	TOT	S_f	S_oU	S_oL	Q_o	Q_fU	Q_fL	TOT
Answers	n:	128	107	108	131	84	84	642	121	105	116	120	95	94	651
	words:	4443	3336	3562	1482	614	626	14063	2944	2430	2798	822	370	396	9760
	average:	34.7	31.2	33.0	11.3	7.3	7.5	21.9	24.3	23.1	24.1	6.9	3.9	4.2	15.0
QEs	epist.:	139	99	99	158	73	71	639	32	22	45	52	33	29	213
	other:	16	10	11	7	37	53	134	5	5	3	0	30	40	83

Table 8 shows the number of direct answers and of words produced in them, based on a total of 132 and 126 reactions per condition in the spoken and written data, respectively. It is remarkable that the Q_f conditions (both spoken and written) attracted much fewer direct answers than the other conditions. Instead, they attracted quite a few indirect answers, while this was hardly the case in the other conditions. This is no doubt related to our observation in the corpus analysis that focusing on the epistemic qualification is not a standard thing to do: forcing subjects to do this thus leads to a tendency to avoid straight answers. The reason why the same did not happen in the Q_o condition, then, is that this condition did not behave as intended in terms of focusing on the qualification (see below). That the unmarked conditions attracted more direct answers than the marked ones is no doubt due to the (un)markedness of these conditions as such. The considerable difference in numbers of words produced in direct answers in the S vs. Q conditions is perfectly logical: saying why something has happened unavoidably requires many more words than saying whether an explanation is sound or what the outcome of a story will be.

b. *Relevant qualificational expressions*

The range of linguistic forms retained for analysis has been defined as follows.

– The category of epistemic expression forms has been defined broadly, to include mixed epistemic/evidential cases (such as *denken* ‘think’ and similar mental state predicates), as well as semantically unclear cases. E.g., it includes the modal *moeten* ‘must’, even if it is not clear whether this is still a mixed epistemic/inferential or rather a purely inferential form (cf. Section 4.1). In the same vein it includes borderline cases of the mental state predicates (cf. Section 3.1). Also ambiguous uses of epistemic forms (e.g. of modals such as *kunnen* ‘may’) have been included. All these borderline cases were given the benefit of the doubt, but in the analyses we will obviously have to keep an eye on them: if they alone run counter to our expectations, this can obviously not be taken as decisive counterevidence (we will face this problem with the modals). Apart from the category of epistemic expressions we have also retained a separate category of ‘other’ expressions, probably all involving purely evidential forms (such as *vinden* ‘find’, a pure expression of subjectivity, or *blijkbaar* ‘apparently’, expressing inferentiality). In the analysis the epistemic category obviously figures centrally, since it is the

topic of the experiment. One cannot expect non-epistemic, purely evidential forms to react significantly to conditions aiming to trigger differences in epistemic expressions. But it may be interesting to see how evidential forms relate to epistemic ones, and whether this relationship is linked to specific conditions.

- In line with our aim to broaden our perspective on the subject matter, we have not only considered the expression types discussed in the previous chapters, but any expression type involving an epistemic (or evidential) meaning.
- We have restricted our analysis to performative expressions: the experiment was designed to draw subjects' evaluations at the moment of speaking, hence it does not allow conclusions regarding descriptive forms.
- Incomplete and repaired expression forms, as well as uninterpretable ones (a few cases which were undecidable between an adverbial or an adjectival status — recall that this difference is not formally marked in Dutch), were excluded.

Table 8 shows the number of epistemic and 'other' expressions produced in direct answers in the different conditions. Appendix 2 gives an overview of all relevant lemmas found in the data, with their semantic classification ('epistemic' or 'other') and frequency. Clearly, the experiment was very successful in the sense that it has attracted relatively large numbers of relevant forms as compared to the corpus data. But there is a serious inequality between the spoken and the written data, much larger than between the spoken and the written corpus data. This difference must be due to the nature of the experimental setting.

To compare the frequency of qualificational expression types across conditions, then, we need relative counts in view of the different amounts of materials produced in each condition. Unlike in the corpus analyses, where I used word counts, the basis here will not be the number of words in the conditions, but the number of direct answers in them. In the context of the experiment the number of words is not very relevant for how often a subject expresses an evaluation regarding the story or its explanation or outcome. Normally, his/her evaluation remains constant during the entire answer. Hence it is not formulated more often than necessary, i.e. usually only once or twice, irrespective of the number of words the subject needs to answer the actual question (only in longer answers, but not in shorter ones, a subject

sometimes repeats the evaluation). On the other hand, more or fewer direct answers obviously does mean more or fewer chances to produce a relevant qualificational expression. The basis for comparison in this experiment is thus completely different from that in a corpus of naturally occurring language.

5.4 Results and analysis

Table 9 shows the frequency of the different epistemic expression types in the data, per 100 direct answers per condition. Table 10 shows the share of the expression types per condition. For the mental state predicates and modals we have distinguished between the major syntactic patterns, viz. complementing and parenthetical, and basic and complementing, respectively. We have not differentiated between the likely and the unlikely variants of the S_o and Q_f conditions anymore, because neither quantitatively nor qualitatively did there turn out to be any significant differences between them (see Nuyts and Vonk 1999). This observation is also relevant for the corpus analysis in the previous chapters: it supports the assumption that at least for the factor of information structure the behavior of the chosen corpus cases is representative for their expression type, despite the fact that they unavoidably

Table 9. *Frequency of epistemic expression types per condition per 100 direct answers*

	spoken				written			
	S_f	S_o	Q_o	Q_f	S_f	S_o	Q_o	Q_f
Sentence adverb	34.4	20.0	1.5	1.2	10.7	11.3	6.7	0.5
Predic. adjective	0	0	0	13.1	0.8	0	0	7.9
MSP — compl.	39.8	24.7	82.4	14.9	1.7	0.9	13.3	6.3
MSP — parent.	9.4	6.0	4.6	1.8	0.8	0.5	0	0
Aux. — basic	12.5	15.8	19.8	5.4	8.3	11.8	22.5	3.2
Aux. — compl.	1.6	0	1.5	26.2	0.8	0	0.8	7.9
Particle	8.6	22.3	8.4	20.8	3.3	5.0	0	3.7
Term adjective	0	0.5	0	1.8	0	0	0	2.6
Noun	0.8	0	1.5	0	0	0.9	0	0
Idiom	1.6	2.8	0.8	0.6	0	0	0	0.5
Total	108.6	92.1	120.6	85.7	26.4	30.3	43.3	32.8

Table 10. *Share of epistemic expression types per condition*

	spoken				written			
	S_f	S_o	Q_o	Q_f	S_f	S_o	Q_o	Q_f
Sentence adverb	0.32	0.22	0.01	0.01	0.41	0.37	0.15	0.02
Predic. adjective	0	0	0	0.15	0.03	0	0	0.24
MSP — compl.	0.37	0.27	0.68	0.17	0.06	0.03	0.31	0.19
MSP — parent.	0.09	0.07	0.04	0.02	0.03	0.01	0	0
Aux. — basic	0.12	0.17	0.16	0.06	0.31	0.39	0.52	0.10
Aux. — compl.	0.01	0	0.01	0.31	0.03	0	0.02	0.24
Particle	0.08	0.24	0.07	0.24	0.13	0.16	0	0.11
Term adjective	0	0.01	0	0.02	0	0	0	0.08
Noun	0.01	0	0.01	0	0	0.03	0	0
Idiom	0.01	0.03	0.01	0.01	0	0	0	0.02

differ from other members of their category in terms of epistemic strength.

Let us start with a few general observations.

– Despite the different frequency of epistemic expressions in the spoken and the written data, the trends in both are roughly comparable, with a few exceptions. The mental state predicates are relatively much less important in the written than in the spoken data, exactly as in the corpus. Less expected is that they also show a different pattern in the two modes (see (c) below). Also the particles have a more limited role in the written as compared to the spoken data. On the other hand, especially the modals but to some extent also the adverbs are relatively much more important in the written than in the spoken data (the former is fully in line with the corpus observations, the latter is less expected.)
– In the spoken and written data alike, the quantitative role of term adjectives, nouns and idioms is negligible, and we have not found any term adverbs at all. This is a significant observation: besides the expression types analyzed in the preceding chapters, only the particles appear to be systematically used for expressing epistemic modality in Dutch. The number of term adjectives, nouns and idioms in the data is too small to allow substantial conclusions about them, so for the sake of simplicity they will be left out of consideration in the remainder of this analysis.
– Not very apparent from Tables 9 and 10 but very manifest in the following qualitative analyses is the fact that the Q_o condition worked

differently from how it was intended. It succeeded in drawing focus on the epistemic evaluation, but on the wrong dimension of it. It primarily drew focus on the polar dimension of subjects' judgment of how the story ends, and not on the scalar dimension as expressed in the epistemic forms we are concerned with. In retrospect, this was a natural thing to happen, since the condition raises an inherent opposition between success vs. failure, or continuation vs. non-continuation of the event in the story. Thus, it holds an inherent potential for a polar contrast. This does not mean that the scalar dimension of the epistemic qualification is not expressed: on the contrary, as Table 8 shows, this condition draws the largest number of epistemic forms among all condition types (which underscores the intimate link between expressions of polarity and epistemic modality). But due to the focus on the polar dimension, the scalar dimension tends to assume a backgrounded role. As a consequence, the nature of the Q_o condition is quite different from that of the Q_f condition, in which the polar dimension has no special status relative to the scalar dimension of the epistemic evaluation. (The Q_o condition does remain profoundly different from the S conditions though, since focus is still on the Q and not on the S.) This explains many of the observations below regarding the different behavior of expression types in Q_o and Q_f. Also in other conditions, however, though less systematically, the different status of the polar and scalar dimensions of the epistemic evaluation, and particularly the inherent contrastiveness of the former but not the latter, will turn out to be a repeated cause for seemingly deviant frequency data.

Let us now take a closer look, also qualitatively, at the different expression types. In the examples, the story number is indicated between brackets (cf. Appendix 1). The English translations are stylistically not always optimal, but they render the Dutch examples as precisely as possible. Short repairs, hesitations, slips, etc., are not translated unless they are relevant for the discussion. The transcription conventions are given on p. xi. Note that '*' does **not** mean 'ungrammatical' here. As will appear from the discussion, the fact that it is not always clear whether stress on an epistemic expression is focal vs. qualificational has several times been an obstacle in deciding whether a form is focal or not.

a. *Sentence adverbs*

The corpus observation (Chapter 2) that sentence adverbs cannot occur in focus is supported by the present data. Firstly, they occur by far most frequently in the S conditions, as a non-focal expression of epistemic modality. A typical example is (234) (spoken S_f).

(234) *misschien heeft die ene ’man hem ge’slagen ofzo
‘maybe that man has hit him or so’ (t1)

In the S conditions the adverb even takes a much more prominent position among the expression types than in the corpus data (cf. Table 7 in Section 4.1). In spoken corpus data the mental state predicate is disproportionally more important, while here this is only slightly so. And in written corpus data the modal turned out to be much more important, while here it is even less important than the adverb. Why this should be so is unclear.

Secondly, even the few cases in the Q conditions (especially in written Q_o) are not counterevidence. The cases in Q_o are subject to the above observation regarding the polarity-focusing nature of this condition. In all cases but one (in the spoken and written data together) focus is clearly on a positive or, most frequently, a negative polar element in the expression, and not on the adverb. One (written) example is (235).

(235) Waarschijnlijk doet hij het niet.
‘Probably he does not do it.’ (t11)

There is only one somewhat doubtful case, viz. (236) (written), in which the subject underlined the adverb. Though the underlining may mean focal stressing, it is more likely to be meant as qualificational stress (cf. Section 2.4), to strengthen the degree of certainty expressed by the adverb. Focus would then rather be on *succeed*. So probably this is not a counterexample either.

(236) Als Gert goed klimt zal het hem ’zeker lukken die pruim te pakken.
‘If Gert climbs well, he will certainly succeed in grasping the plum.’ (t03)

The cases in Q_f do not contradict our corpus findings either: in these the adverb each time plays a subsidiary role in the answer. (237) is one (spoken) example. Clearly, the adverb is not the focal part of the information in this answer.

(237) *t_is misschien ’onderdeel van de verklaring maar niet de hele verklaring
‘it may be part of the explanation but not the entire explanation’ (t04)

b. *Predicative adjectives*
The trend for the predicative adjectives to be preferentially used when the qualification is focal is even stronger here than in the corpus data. With one single exception, they exclusively occur in Q_f, as the focal constituent. Syntactically they appear nearly exclusively in a reduced form, mostly of the type *that is probable*, as in (238) (spoken), or a few times of the type *I find this explanation probable* (i.e. a more subjective variant), as in (239) (written). There is only one full complementing form of the type *het is waarschijnlijk dat* … ‘it is probable that …’.

(238) dat lijkt me wel heel waar’schijnlijk euh~ wat je zegt
‘that seems to me very probable, what you say’ (t07)

(239) De verklaring vind ik minder aannemelijk.
‘I find the explanation less acceptable.’ (t01)

It may seem surprising, though, that the predicative adjectives are not the most frequent expression type in Q_f, since in the corpus data they are absolutely the most frequent focal form. As will appear from the discussion of the modals and mental state predicates in this condition (see (c) and (d) below), however, the corpus observation is not (necessarily) contradicted by the present data.

The fact that there are no adjectives in Q_o can again be related to the special status of this condition: since the scalar dimension, expressed by the adjective, is not focal there, their absence in this condition is perfectly in line with the initial assumption.

The only adjectival case in the (written) S conditions, (240), is a non-focal full complementing one (focus is on the protagonist’s having drunk alcohol).

(240) Het is mogelijk dat hij alcohol gedronken heeft. Het regent en t kan glad zijn op de weg. Beide argumenten kunnen maken dat hij de controle over het stuur verliest.
‘It is possible that he has drunk alcohol. It is raining and it may be slippery on the road. Both arguments can make him lose control over the steering wheel.’ (t07)

c. *Mental state predicates*
Also our corpus findings regarding the mental state predicates are basically corroborated by the present data, even if the purely quantitative information in Tables 9 and 10 may seem to contradict this.

Let us first look at the parentheticals, which should never be focal. Although they predominantly occur in the S conditions, where they are consistently non-focal, there are also quite a few of them in the spoken Q conditions. But none of these has focus. In all occurrences in Q_o there is a negative or positive polar element which is actually focal (in line with the nature of this condition — see above), and the parenthetical has a backgrounded position. (241) contains half the number of cases in this condition.

(241) ja hij zal s~ ut uiteindelijk denk ik ’wel doen !!! *hij had dan ’denk ik nog even ge’wacht tot de regen voor’bij was en dan was ie/ eindelijk denk ik ’toch nog wel gegaan
‘yes he will eventually, I think, do it !!! he had then, I think, waited briefly till the rain was over and then he had finally, I think, gone nevertheless’ (t08)

Sentence stress is on the positive polar markers *wel* in the first and *toch nog wel* in the last clause (impossible to translate, since English has no comparable forms). Stress on the second parenthetical is clearly qualificational: focal stress is on *gewacht* ‘waited’, which in a way involves negative polarity as it selects the negative option (with temporal limitation) to the question whether the protagonist runs on. In all cases in Q_f the parenthetical supports another qualificational expression, which **is** focal. An example is (242), in which the focal expression characterizes the quality of the explanation offered.

(242) da_s niet/ niet ’korrekt denk ik
‘that’s not correct, I think’ (t12)

The quantitative results regarding the complementing mental state predicates — which according to the corpus data can be yet hardly ever are used focally — are complex. In the spoken version this is clearly the most important epistemic expression type in the S conditions. But it is also absolutely predominant in Q_o, and it is even disproportionally more frequent there than in the S conditions. In Q_f it is not too frequent as compared to the other conditions, but still more than expected. In terms of the experimental

design, the unmarked conditions (S_f and Q_o) clearly draw many more forms than the marked ones. The written version offers a different picture. There the form hardly occurs in the S conditions. This is not completely unexpected since also in written corpus data the mental state predicate is not predominant, but the extent to which this is the case here is quite radical. But, surprisingly, this form does take an important position in the Q conditions (although the modal remains more important there), and, again, especially in Q_o. A qualitative look at the complementing cases reveals that they are not contradicting the corpus observations, though.

– In the S conditions, both spoken and written, all occurrences (all full complementing, except for 6 reduced cases, i.e. 5.6% of the cases in these conditions) but one are, in line with the nature of the conditions, clearly non-focal (also the reduced cases). Illustrations are (243), containing a full and a reduced case, from spoken S_o, and (244), a complementing case from written S_f.

(243) ik denk dat_tie eh~/ dat_tie nog ’aankomt rennen met zun ’koffers en dan nog niet eens inge’checkt heeft/ *dat denk ik dus// *dat_tie daar *dat ze ’daarom zeggen van ja datteh dat gaat hier niet/ dat gaat niet ’door/ *en al die passagiers die moeten ’wachten op hem dus
‘I think that he comes running with his suitcases and has not even checked in — that’s what I think — that that is why they say this does not work — this is not going through — and all those passengers who must wait for him so’ (t05)

(244) Ik denk dat hij iemand anders, nl zijn geliefde, verwacht had i_p_v degene die nu voor het raam verschijnt.
‘I think he had expected someone else, viz. his beloved, instead of the one who now appears at the window.’ (t06)

A potential exception is the reduced form in (245) (spoken S_f), in which the informational status of *weet* ‘know’ is not entirely clear but would seem to involve contrastive focus (together with the negation, of course).

(245) *mmmisschien dat de a’genten nog/ ’twijfelen of dat ja niet zn ’handlanger was dat ut in ’scene gezet was ofzo/ *ik ’weet het niet
‘maybe the police officers are still doubting whether he wasn’t his helper, that it was set up or so, I don’t know’ (t12)

– In line with the special status of the Q_o condition, the complementing cases in it (mainly full forms, apart from 16 reduced forms, i.e. 12.9% of cases in spoken and written Q_o) are predominantly non-focal: usually it is again a positive or negative polar element in the utterance which draws focus. Illustrations are (246) (spoken, full) and (247) (written, reduced). Nearly all reduced occurrences are exactly like the latter, though sometimes with a positive instead of a negative polar marker.

(246) ik denk dat_tut eh/ hem ’niet lukt de ’pruim te pakken
‘I think he does not manage to pick the plum’ (t03)

(247) Ik denk het niet.
‘I think not.’ (t10)

There are 3 possible exceptions (i.e. 2.4% of the cases), all of the reduced type (all spoken). The second *denk* ‘think’ in (248) is one of them. In all these cases there is a clearly focal polar marker. The predicate is stressed, however, and may possibly be considered focal too, although it is more likely that it actually carries qualificational rather than focal stress.

(248) k_denk niet dat ie ’doorloopt !!! *dat ’denk ik niet
‘I don’t think he runs on !!! I don’t think so’ (t08)

– Even in Q_f, however, complementing forms (59.5% reduced, 40.5% full) are predominantly non-focal, counter to the nature of the condition. Only 7 cases (i.e. 18.9%, all reduced, spoken) possibly involve focus, though many of them are doubtful. Examples are (249) and (250), both subject to the same remark as (248).

(249) ja ik ’denk ut ook
‘yes I think so too’ (t06)

(250) neuh da ge’loof ik niet
‘no that I don’t believe’ (t06)

Answers with full complementing forms are typically of the type in (251), (252), (253) (all spoken; (252) no doubt involves qualificational stress) and (254) (written). Focus is always on a positive or negative polar element (in (252) and (253)), and/or on elements such as *klopt* in (251), *correct* in (252), *is* in (253), and *mogelijk* in (254), i.e. expressions

assessing the subject's opinion about the explanation, but then in terms of the formal correctness of the argument or the factuality of the state of affairs, rather than epistemically.

(251) k_ denk da ut ’klopt
'I think that is right' (t04)

(252) ik ’denk dat dat oordeel niet cor’rect is
'I think that this judgment is not correct' (t07)

(253) ik denk inder’daad dat dat zo ’is
'I think indeed that that is so' (t12)

(254) Ik denk dat deze verklaring mogelijk is.
'I think this explanation is possible.' (t07)

Answers with reduced forms usually have focus on a positive or negative polar element in the utterance, as in (255) (spoken) and (256) (written).

(255) nou ik denk ut ’niet
'well I think not' (t12)

(256) Geloof ik niet.
'I don't believe so.' (t01)

Clearly, then, Q_f does draw focus on the speaker's evaluation, but the mental state predicate tends to play a subsidiary role in its formulation. Hence it is much less frequently used in focus than the adjectives (see b above).

In summary, the present data are in line with the corpus analysis: subjects avoid focusing mental state predicates. (Cf. also the complete absence of the negative mental state predicate *betwijfelen* 'doubt' in the present data.) The analysis does suggest a pattern which was not apparent in the corpus analysis, however: especially the enormous frequency and the quality of the mental state predicates in Q_o, but also their uses in the other conditions, indicate that they, rather than other expression types, are preferred when the speaker wants to focus on a positive or negative polar expression, separately from the scalar dimension expressed by the predicate. This is no doubt partly because a modal such as *kunnen* is seriously limited in its combinability with negation and the adjectives are used for focalizing the epistemic evaluation. Hence only the mental state predicates and adverbs

are freely available for this purpose. Why the adverbs should not also be used systematically this way is not obvious, however.

All of the foregoing leaves unexplained the observation that in the spoken version the mental state predicates appear to prefer unmarked over marked conditions. We have no clue as to why this should be so.

By the way, the present data contain several semiparenthetical cases of the type observed in the corpus data. This goes to show that such forms are clearly not accidental. I will not go into them, however, as they do not add anything to the discussion in Section 4.4.

d. *Modal auxiliaries*

Also our corpus-based assumption that the modals do not allow focalization can be maintained in view of the present data, albeit in a less straightforward way. They very commonly occur in the S conditions. But they predominantly occur in the Q conditions, and except for the much more important role of the mental state predicates in spoken Q_o, they clearly predominate over all other expression types there. A qualitative look at their occurrences immediately reveals that we are again plagued by the problem of the semantic ambiguity of these forms, however.

– In the S conditions, written and spoken, all modals (basic and complementing) except one are systematically non-focal, consistent with the nature of these conditions. Typical examples are (257) (spoken S_o — the relevant case is basic *zal* 'will' in the second utterance), (258) (written S_f — the relevant case is basic *moet* 'must' in the second utterance), and (259) (written S_f — both basic *zal* 'will' and complementing *kan* 'may' are relevant instances).

(257) ja koos wil ehm~/ zun vrien'din laten/ merken dat_tie 'alles voor haar over heeft// ehm~// *hoewel hij ut waarschijnlijk niet zal 'zeggen maar/ *misschien doet ie ut nu op zich'zelf *hij heeft juist// *hij gaat ut hele zun 'hele/ bedrag wat_tie eh~/ waar_die een maand van moet 'leven// gaat_tie uitgeven aan een kado voor 'haar en dat vindt_tie van zichzelf een heel romantische 'daad
'yes koos wants to let his girlfriend feel that he wants to do anything for her — although he probably will not say so, but maybe he does it now on his own — he has just — he is going to spend the entire sum from which he must live one month on

a present for her and he considers that a very romantic deed of himself' (t10)

(258) Door de storm heeft de jongen zich niet goed kunnen redden. Hij moet ongelukkig gevallen zijn.
'Due to the storm the boy has not been able to get through very well. He must have fallen in an unfortunate way.' (t09)

(259) Waarschijnlijk omdat hij wat gedronken heeft. Hij voelt zich niet lekker (hand aan hoofd). Bovendien regent het, dus zal het mindere zicht een handje geholpen hebben. Het kan ook zijn dat hij stoer wil doen door met drank op te gaan rijden en had ie pech dat het regende.
'Probably because he has drunk somewhat. He does not feel well (hand at head). Moreover it is raining, so the reduced visibility will have played a role. It may also be that he wants to show off by driving under influence and he had bad luck that it was raining.' (t07)

The only case which might raise doubt is (260) (spoken S_o). The subject concludes his/her explanation by repeating the outcome of the story offered to him/her, but adding and stressing its inevitability. The latter is probably not an epistemic/inferential meaning, however: *moet* 'must' here rather expresses 'inherent necessity' — the situation is such that the event must come about — i.e. a dynamic modal meaning (cf. Section 4.1). Hence this is probably not a counterexample to our assumption about the epistemic modals.

(260) ja t_is 'zoo_n klein 'vliegtuigje dat wacht gewoon op zn passa'giers/ [lacht] *hij rent zo 'hard dan 'moet ie ut wel halen/ [N:oke] *de 'trap staat ur ook nog 'buiten dus
'yes it is such a small plane it simply waits for its passengers — he runs so fast so he must/cannot but catch it — the stairs are still standing outside there too so' (t05)

– In line with the nature of the Q_o condition, nearly all cases in it (spoken and written, basic and complementing) have focus on an explicit positive or negative polar marker (this involves nearly exclusively uses of *zullen* 'will', which can combine with negation in the clause — see Section 4.4a).

With only one exception none has focus on the modal. Examples are (261) (spoken, containing 2 of the 3 complementing cases, and 2 of the 4 instances of *kunnen* 'can/may' in this condition) and (262) (basic, written). In the former, the special construction with only a positive or negative polar marker in the embedded clause and *van* (literally) 'of' used as a complementizer is reminiscent of a similar pattern occurring in the Dutch mental state predicates (see Section 3.4a).

(261) *ja kan van ’wel en kan van ’niet/ *ik ’denk dat ie um euh~/ *ik ’denk dat ie um ’niet gaat ’kopen […]
'yes it may be that he does and it may be that he does not — I think that he — I think that he will not buy it […]' (t10)

(262) Het zal Gertje niet lukken om de pruim uit de boom te plukken.
'Gertje will not succeed in picking the plum from the tree.' (t03)

One (written) case, the 3rd complementing one, an instance of *kunnen* 'can/may', appears to have focus on the modal, viz. (263). But the question is again whether this involves epistemic modality and not rather dynamic modality, i.e. indicating the inherent possibility for the event to succeed. If so, then this is again not a counterexample.

(263) t Zou kunnen.
'It could/might be.' (t05)

– Q_f draws a very high number of complementing cases (exclusively reduced ones), many more than basic forms. This is quite remarkable in view of the rarity of complementing forms in the corpus data. Counter to the nature of the condition, the basic forms are never clearly focal, although especially in the written data the shortness of the answers sometimes makes it difficult to determine this with absolute certainty. They are nearly all of the type in (264) (written) or variants with a non-verbal predicate such as *dat kan een verklaring zijn* 'that can/may be an explanation'. These thus all involve a main (verbal or non-verbal) predicate which also somehow evaluates — albeit not epistemically — the explanation offered to the subject. (Even *een verklaring zijn* 'to be an explanation' is evaluative, since the indefinite article implies that the subject considers there to be other possibilities, hence is not fully convinced.) Exactly as in similar cases with the mental state predicates, then

(cf. (c) above), focus is drawn by this main predicate.

(264) Ja, dat kan wel kloppen.
‘Yes, that can/may be right.’ (t12)

The large majority of complementing cases, however, does have focus directly on the modal. A prototypical example is (265) (spoken). Practically all complementing instances are minimal variants of this one.

(265) ja/ dat zou best ’kunnen
‘yes — that could/might very well (be)’ (t01)

Yet the same remark applies as for (263) above. With one exception all complementing cases involve the modal *kunnen* ‘can/may’. (Also most basic forms involve *kunnen*. This is completely different from all other conditions, where *zullen* ‘will’ absolutely prevails.) The exception is a case of *zullen* ‘will’, which occurs after a long answer stating indirectly that the subject agrees with the explanation. Thus, it only summarizes the point of the indirect answer, and like the absolutive uses of adverbs (cf. Section 2.4f) it can be considered non-focal. With only two exceptions, then, all occurrences of *kunnen* are without the existential predicate *zijn* ‘be’, hence they are inherently ambiguous between an epistemic and a dynamic reading. Determining which of the two is meant is even more difficult here than in the corpus data: the nature of the task is such that both readings are equally conceivable, and in most answers of the type in (263) or (265) there are no further clues to help one decide, as there is no further context. The two unambiguously epistemic cases with *kunnen* (both spoken), then, happen not to have focus on the modal as such: (266) has focal stress on the adverbial elements strengthening the qualification, in (267) there is focal stress on the existential predicate. Obviously, in both cases the elements in focus are immediately linked with the epistemic evaluation, yet it is significant that the modal itself does not get focus. It is intuitively even impossible to assign focal stress to the modal in these two cases.

(266) dat_s/ kan ’heel goed zijn
‘that — may very well be’ (t09)

(267) ja da kan goed ’zijn
‘yes that may well be’ (t07)

Obviously, then, the modals can be used in focus, but it is undecidable whether this observation concerns epistemic uses of the modals, or rather dynamic ones (which would thus not be subject to the restriction to non-focal uses — see Section 6.5). If we omit all ambiguous cases, there are no focal uses left, not even in the Q_f condition. The near absence in the latter of modals other than *kunnen*, and especially of *zullen*, which is predominant in all other conditions but which does not have the same ambiguity as *kunnen*, is also significant in this respect. *Zullen* is obviously also inherently ambiguous, viz. between a future and a purely epistemic reading. But this future reading cannot serve as an answer to the present experimental condition, unlike the dynamic reading of *kunnen*. It seems fair to conclude, then, that the present data do not undermine our analysis in Chapter 4 that the epistemic modals, even the complementing ones, are never used focally. If so, also our finding that the adjectives are the prime expression type for focalizing the (scalar dimension of the) epistemic qualification remains upright.

Of course, the systematic ambiguity of *zullen* and *kunnen*, which together comprise the lions' share of the modals in the S_o and Q_o conditions, throws a shadow on the interpretation of the high frequency of the modal even in those conditions. But that obviously does not affect the issue of the focal uses of the modals.

e. *Particles*

The particles appear much more frequently in the spoken than in the written data (not surprisingly for a native speaker of Dutch), and more frequently in the marked than in the unmarked conditions. But otherwise they are more or less equally shared by the Q and the S conditions. A qualitative look at the cases shows that they are never focal in the data, not even in the Q conditions. This is not surprising in view of their adverb-like nature. Examples, both featuring the particle *wel*, are (268) (spoken S_o) and (269) (written S_o). It is difficult to translate the particle in these expressions into English as there is no equivalent for them. Modal adverbs offer the best approximation.

(268) hij heeft hem ge'haald omdat de 'trap nog niet helemaal weggehaal~gehaald was/ [E:ja] *dus nog wel iemand naarboven kon
'he has caught it because the stairs were not completely removed yet — so probably someone could go up' (t05)

(269) Hij haalt haar niet in omdat hij er eigenlijk niet goed langs kan, anders wordt hij aangereden door de autoos en de afspraak wacht wel een paar minuutjes op hem.
‘He does not pass her because he is actually not very well able to, otherwise he will be hit by the cars and the appointment will probably wait a few minutes for him.’ (t11)

A quite prominent feature of the particles is that they show a strong tendency to co-occur with other epistemic expression types (this is especially true in the Q conditions). Thus, 54.3% of the spoken and 54.5% of the written particles co-occur with other epistemic expressions, while this is only the case for a small minority of all other expression types (apart from combinations with a particle). Examples, again all involving the particle *wel*, are (270) (spoken Q_o; recall that one should not confuse *wel* as a particle, which is never stressed — the second occurrence of the form — with the homonymous positive polar marker, which is always stressed, at least to some extent — the first occurrence in (270)), (271) and (272) (both spoken Q_f). The particles can again not be translated, but here they basically support and slightly strengthen the co-occurring epistemic expression.

(270) ja hij zal s~ ut uiteindelijk denk ik ’wel doen !!! *hij had dan ’denk ik nog even ge’wacht tot de regen voor’bij was en dan was ie/ eindelijk denk ik ’toch nog wel gegaan
‘yes he will ultimately do it I think !!! he had then I think waited a bit longer until the rain was over and then finally I think he had nevertheless gone further’ (t08)

(271) ja da lijkt me wel waar’schijnlijk
‘yes that seems probable to me’ (t04)

(272) *dus ik denk wel dat ut ’klopt
‘so I think that is right’ (t07)

Thus, particles to a considerable extent appear a ‘supportive’ rather than an independent epistemic expression type. Maybe that is why they dominate in the marked conditions: maybe the supportive role of the particle is more often needed there than in the unmarked conditions. But it is still unclear why that should be so.

f. *The co-occurrence of epistemic and evidential expression types*
Finally, let us take a look at the co-occurrence of the 'other', probably all purely evidential expressions with epistemic forms. Such co-occurrences are not overwhelmingly frequent: 22.4% of the spoken and 8.4% of the written 'other' forms. But to the extent that they exist, there turns out to be a clear pattern in when they occur. Without going into the details of which evidential forms relate to which epistemic ones, Table 11 shows the frequencies of combinations in the different conditions, in the spoken and written data. 'Pairs' are combinations of one epistemic and one evidential form, 'triplets' are combinations of 3 expressions of which at least one is epistemic and at least one evidential. Clearly, there is a very strong trend for these combinations to occur in Q_f, in actual practice the only condition in which focus is really on the subject's evaluation of the explanation offered to him/her. In fact, a considerable majority of co-occurrences involves focal epistemic adjectives. (Quite a few co-occurrences also involve an epistemic particle, however, with or without an epistemic adjective, which further adds to the image of the particles as a supportive expression form observed in the previous section. See also Section 6.6 on the possibilities for combining epistemic and evidential forms.) Apparently, if one speaks about one's epistemic evaluation as such, as foregrounded information, there is a tendency to add information about the nature of one's evidential background. This tendency is absent if one's epistemic evaluation is itself only background information in the context of talk about a state of affairs, or even about a positive or negative polar evaluation for that matter (in view of the near absence of co-occurrences in Q_o). But see Section 6.6 for a further nuancing of this observation.

Table 11. *Frequency of co-occurring epistemic and 'other' expressions per condition per 100 direct answers*

	spoken				written			
	S_f	S_o	Q_o	Q_f	S_f	S_o	Q_o	Q_f
Pairs	0	0.5	0.8	7.8	0	0	0	3.7
Triplets	1.6	0.5	0	7.1	0	0	0	0
Total	1.6	1.0	0.8	14.9	0	0	0	3.7

5.5 Summing up

It turns out, then, that our corpus findings regarding the information structure of epistemic expression types are largely supported, or at least not contradicted, by the present experimental findings. This is completely true for the adverbs, which never occur in focus, for the adjectives, which are predominantly used focally, and are thus the most import expression type in focal conditions, and for the mental state predicates, which can be but rarely are used in focus, and if they are, only in the complementing form. Only for the modal auxiliaries are our corpus findings overshadowed by the fact that in the experiment they are frequently used under conditions of focality. But since all focal cases of the modals are unresolvably ambiguous ones, it is fair to maintain that even in this case our observation in Chapter 4, that they are not used focally, not even when occurring in the complementing pattern, is not disproved.

For the rest, we have observed that the mental state predicates in particular show a strong tendency to be used in combination with a focal positive or negative polar expression form. An explanation for this is outstanding. Moreover, it turned out that besides the expression types analyzed in the corpora, only the particles have a significant role in expressing epistemic modality in Dutch, even if mainly as a supporting form for other epistemic expressions. Like the adverbs, they appear to be used only in non-focal ways.

Overall, the present investigation has confirmed the tendency which was apparent in the corpus investigation that speakers tend to avoid using epistemic expressions under conditions of focality. Even if they are forced to focus on the evaluation, as in this investigation, they try to circumvent this. Thus, even in this experiment the predicative adjective — the ‘specialist’ for focal epistemic evaluations — is by far not the most frequent form type in Q_f, although it **is** the most frequently focused form type there. Instead, speakers use escape routes. E.g., in the case of the modals, they (presumably) express a dynamic modal qualification, i.e. one in terms of inherent possibility rather than likelihood. Or, in the case of the modals and especially the mental state predicates, they ‘download’ the focality to an expression concerning the formal character of the argument or the factuality of the state of affairs, and the actual epistemic expression is then related to this yet without appearing in focus itself. Or they simply do not answer the questions

straightforwardly, but only indirectly (cf. the relatively smaller number of direct answers produced in Q_f). It seems we have hit upon a very profound property of epistemic modality as a qualificational category. I will turn to that in the next chapter.

Chapter 6

The cognitive structure of epistemic modality

6.1 The syntax of epistemic expressions: Structure shaped by multiple functions

We have reached the end of the empirical part of our analysis. Before moving on to the theoretical part, let me first sum up and add a few further reflections on our findings. We have a strong case for our initial assumption that the expression types analyzed do form a paradigm of alternatives to communicate one and the same semantic concept, viz. an epistemic evaluation (cf. Section 1.3). The speaker's choice for one of them can be explained nearly entirely in terms of (an interaction of) the series of additional functional factors introduced. These all have their own existence independently of the epistemic qualification (cf. Section 1.4), but in this paradigm they interfere in many ways with it, as should be the case if the latter is really basic to all these form types (cf. Section 1.3). That these additional factors practically always work through the syntax of these expression types, while epistemic modality is obviously inherent in their lexical semantics, further underscores the relative peripherality of the former relative to the latter in this paradigm.

Only the speaker's choice between the adverbs and modal auxiliaries appears due to factors other than these, viz. partly to the semantic element of specificity of the epistemic evaluation, and partly to the purely structural need to 'spread the load' over form types in case several qualificational dimensions need expression. Quite generally, specificity of reference to the epistemic scale is the only semantic difference between the expression types encountered which may seem due to the conceptual dimension of epistemic modality as such. Yet, upon closer scrutiny, even this dimension can be related to the other functional factors. We have already related the relative vagueness of the modal auxiliaries to their grammatical status

(cf. Section 4.1b), and this, in turn, may be an effect of the factor of information structure, as I will argue below. And see also Section 2.4n on the close relation between the specificity of an expression and its informational salience. The vagueness of the mental state predicates is probably due to their historical origins (cf. Section 3.1b), but the fact that they have not developed a more specific epistemic meaning may be due to their status as mixed epistemic/evidential forms.

These additional functional factors in combination with the epistemic evaluation itself, then, have allowed us to account for a wide range of (differences in) major behavioral properties of these expression types, such as combinability with a polarity marker or with certain tenses, possibilities for usage in questions or conditionals, for contrastive uses, etc. From a superficial linguistic perspective (common in traditional linguistics) one might be inclined to assume that the choice for an expression type is determined by these linguistic features as such (e.g. by the possibility to also express negation, or to have an epistemic form in a question). But in the present functional depth analysis such elements of linguistic choice can be explained via the functional factor triggering the feature (e.g., in a negative epistemic evaluation, the informational status of its components and the possibility of expression types to code it).

Even the global syntactic patterning of the epistemic expression types appears determined by an interaction of the semantic status of the epistemic qualification with the additional functional factors. To conclude our analysis, let me tie up the loose ends left in Chapters 2–4 in this connection. We have observed a remarkable systematicity in the syntactic patterns in which the different expression types occur, across the three languages considered. This system is schematically rendered in (273).

(273)		*Complementing structure*		*Flat structure*
	Adj./Adv.:	it is probable	that SoA	S probably oA
	MS-pred.:	I think	(that) SoA	S, I think, oA
	Modal aux.:	it may be	that SoA	S may oA

If we consider the adverbs and adjectives as variants of one expression type (see Section 6.4), then each category of expressions shows an opposition between a complementing and a ‘flat’ pattern. In the complementing pattern the qualificational expression occurs in a superordinate clause and the

expression of the state of affairs in a subordinate complementing clause. In the flat structure the qualificational expression is ‘slipped into’ the expression of the state of affairs, with various degrees of integration, from strong in the modals to very weak in the parentheticals. However, we have also observed different, even seemingly contradictory tendencies in these patterns: in the adverbs and adjectives the patterns seem quite stable, in the mental state predicates there is a clear trend towards parenthetization, and in the modals there is a trend towards complementation. We have furthermore noted links between these patterns and the expression types’ possibilities in terms of information structure (cf. Sections 2.4, 3.4 and 4.4), yet without arriving at a clear picture: the situation was straightforward for the adverbs and adjectives, but this was much less the case for the mental state predicates and modals.

From a macrostructural and diachronic perspective, then, the syntax of this paradigm appears primarily molded by the complex interaction, or to a considerable extent counteraction, of two critical forces, viz.:

– an information-structural force: a tendency to shape linguistic patterns such that they suit the demands of the informational status of parts of an utterance in the organization of discourse, in this case particularly the default informational status of the epistemic qualification relative to the state of affairs; and
– an iconic force: a tendency to preserve in surface structure the conceptual relations existing between the chunks of information contained in the utterance (see Haiman ed., 1985), in this case particularly the status of the epistemic qualification as a meta-operator over the state of affairs.

In terms of information structure, we have observed a persistent tendency for the epistemic qualification to assume a non-focal position in linguistic expression.[1] With hindsight, this should not have surprised us too much, precisely in view of the conceptual meta-status of the epistemic qualification.

1. It has been observed before, though never systematically investigated empirically (cf. Langacker 1974; Lötscher 1985; Chafe 1994) that, in terms of information structure, qualificational expressions in general (or ‘regulatory units’, as Chafe calls them) seem to behave differently from linguistic material representing the state of affairs (i.e. the ‘objective content’, as Langacker called it). When put in such general terms, however, this assumption is probably not entirely correct, or at least too unnuanced. See Section 6.5.

As Plank (1981: 67) suggested already (see also Steele 1975b; Plank 1984):

> Solche Relativierungen des Wahrheitsanspruchs [i.e. epistemic qualifications — JN] selbst werden in der Regel nicht das thematische Zentrum von Mitteilungen bilden; die Vordergrundsinformation sollte in der Regel eben die Proposition sein, deren Wahrheitsanspruch in epistemisch modalisierten Äußerungen explizit relativiert wird.

That is, epistemic qualifications do not show up for their own sake: relativizing the truth of a state of affairs is usually, if not always, done in the context of a discourse about that state of affairs, and not about the qualification. The epistemic qualification thus constitutes side-information relative to, or is informationally dependent upon, the information about the state of affairs (I will return to this in Section 6.5 below). Hence it requires very special circumstances for it to become focal, focality being in the province of foregrounded information. Essentially, as we have seen, this only happens when the qualification acquires a position of contrast in the discourse context.

The special informational status of epistemic expressions can thus be related directly to their conceptual status. Nevertheless the two forces pull in partly different directions. From the perspective of iconicity, a syntactic pattern with the epistemic qualification in the main clause and the state of affairs in a complement clause is perfect, since it directly reflects the meta-status of the qualification relative to the state of affairs. This explains the strong affinity of expressions of epistemic modality (and evidentiality, for that matter) for a complementing structure. Also the fact that this involves a finite *that*-complement, and not, e.g., an infinitival complement, may be a matter of iconicity. As Givón (1990: 560, 1995: 125ff) and others (e.g., Van Valin 1993: 111f) have argued, different types of complements show different degrees of syntactic integration of main and embedded clause, and this reflects the degree of conceptual integration of the events in the two clauses. The integration is weaker in finite than in infinitival complements. Hence the qualification's choice of the former reflects its conceptual status separate from the state of affairs.

In view of the default informational status of the epistemic qualification, however, a complementing pattern is not very attractive. Syntactic subordination appears strongly correlated with informational subordination: main clauses prototypically carry foregrounded and embedded clauses backgrounded information (Givón 1984; Tomlin 1985; Brandt 1994). Since the

state of affairs rather than the epistemic qualification tends to be foregrounded, hence to contain/be the focal information, the information-structural force no doubt works against a main clause position for the epistemic expression and an embedded clause position for the expression of the state of affairs. The 'free' position which the clause-internal epistemic expressions (cf. the adverbs and the parentheticals) tend to assume may then be a compromise. It is perfect from the perspective of the information-structural force. And it is acceptable from an iconic perspective: even if the hierarchical relationship is no longer represented, it at least still reveals that the qualification is not 'part' of the state of affairs.

With this in mind, let us reconsider the syntactic organization of the different expression types. That the qualificational mental state predicates (and related predicates — see Section 3.1a) are standardly complementing is an effect of the iconic force. The tendency for them to also get used parenthetically, however, is due to the information-structural force. Possibly it is no accident that we have observed an active process of reduction of the main/embedded clause structure and of parenthetization in them: for Dutch, the MW (see Section 4.7) only cites complementing forms of epistemic *denken*, no parenthetical ones, so this trend may be fairly recent and in full course.[2] But maybe there will always remain semiparenthetical uses, no matter how long the process has been going on, for the two forces always remain active, of course. This process as currently evolving is probably quite similar to earlier developments of complementing mental state predicates into modal adverbs, so it may ultimately result in the formation of new adverbs. The strong similarity between parentheticals and adverbs is obviously in line with this. There are several examples of this development. The English evidential (and possibly epistemic) adverbs *presumably* and *supposedly* derive from *presume* and *suppose*, and their Dutch and German equivalents *vermoedelijk* and *vermutlich* from *vermoeden* and *vermuten*. The South African adverb *glo* 'possibly' derives from *geloven* 'believe' (Thompson and Mulac 1991: 318). And Tok Pisin and a few other pidgins have developed similar adverbs from English *I think* (Thompson and Mulac 1991: 327).

2. This is a tentative observation, though, since the MW and WNT are not optimal sources in this regards: as dictionaries, they offer reliable semantic information, but they may be less reliable for syntactic information.

Ramat and Ricca (1998) offer many more examples, showing that this is a recurrent developmental path in many European languages.

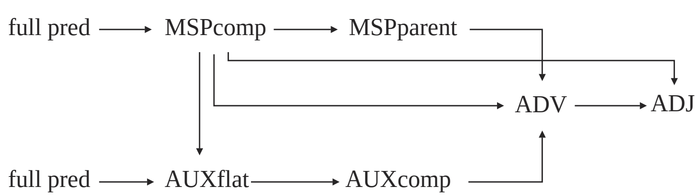
The development of the modals out of independent predicates (cf. Section 4.7) is probably due to, or at least reinforced by (see below) the information-structural force (Steele 1975; Plank 1981): grammatical markers are informationally ‘low profile’ expressions, and this suits the normally non-focal position of the epistemic qualification. In some cases the predicates in which the modals originate are, at least in Dutch, semantically similar to mental state predicates. E.g., *kunnen* derives from a predicate meaning ‘to have a mental capacity’. So this development may have been from mental state predicate into modal. Such a development has also been attested in Mupun, e.g. (cf. Frajzyngier 1991: 233). Since in Dutch the oldest occurrences of epistemic *kunnen* in the WNT are all sentence-internal, the trend towards a complementing form is probably very recent. And it may again be a matter of iconicity. For, iconically, the clause-internal modal is disfavorable: as a grammatical marker it is per definition strongly integrated in the clause, so it even lacks the free status characterizing the adverbs and parentheticals. Whence the tendency to move the modal from the clause representing the state of affairs into a higher clause.

This development may again be followed by one in the opposite direction. Several adverbs and adjectives in West Germanic originate in modals in a complementing pattern. This is true, e.g., for English *maybe*, Dutch *misschien* ‘maybe’ and *mogelijk* ‘possibl(e/y)’ and German *möglich(erweise)* ‘possibl(e/y)’, all from *may*, *mogen* and *mögen*, or for Dutch and German *waarschijnlijk* and *wahrscheinlich* ‘probabl(e/y)’ and English, Dutch and German evidential *seemingly*, *schijnbaar*, and *scheinbar* and *anscheinend*, all from the evidential auxiliary-like predicates *seem*, *schijnen* and *scheinen*. (In Dutch these developments probably took place in the Middle Dutch period.) Similar links between modals and adverbs are testified by Silva-Corvalán (1995) for Spanish, and by Ramat and Ricca (1998) for several other European languages. The development of the adverbs (as mentioned, similar to the development of the parentheticals) may again be an effect of the information-structural force. The development of the adjectives may be subsequent: for Dutch, the first adverbial entries of *waarschijnlijk* and *mogelijk* in MW and WNT tend to be slightly older than the first adjectival ones. If so, this may again be an effect of the iconic force. (Some adjectives

clearly do not derive from adverbs though: Dutch and German *aannemelijk* and *annehmbar* 'plausible', which have no perfect match in English, directly derive from the mental state predicates *aannemen* and *annehmen* 'assume'.) As observed, the adjective has become specialized for focalizing the epistemic qualification. Since its complementing structure is also perfect from this perspective, there are no signs of a tendency to undo this structure. Since epistemic modality is only rarely salient, however, it is no surprise that this expression type is rarely used. That precisely the adjectives should have been specialized for focal uses is probably no accident, though. As argued, focality, particularly if due to contrastivity, may be correlated with a higher specificity of the epistemic qualification. Among the complementing epistemic expression types, then, the adjectives are most specific, and are moreover very flexible in allowing further nuancing of the qualification through additional modifiers (cf. Section 2.4n).

Significant in all of this (see Section 6.4) is the fact that the functional forces override the borders between expression types: there turns out to be considerable cross-feeding and -bleeding between the latter. But the process is apparently not entirely random. As the overview in (274) of the (no doubt incomplete) observations above shows, the process normally starts with full verbs and ends in adverbial and adjectival forms. I am not aware of developments from the latter back to mental state predicates or auxiliaries in West Germanic.[3]

(274)



3. Some arrows in (274) are tentative: e.g., from complementing mental state predicates to adverbs (or does this always go via parentheticals?), and from complementing mental state predicates to sentence-internal auxiliaries (or should this start from the parentheticals?). The schema obviously also disregards the fact that the epistemic auxiliaries (but not the mental state predicates) developed from independent predicates indirectly, via other modal meanings.

If this is correct, then this casts a shadow over the assumption widespread in the literature that all diachronic change in this area goes unidirectionally from lexical to grammatical along stages of ever-increasing degrees of grammaticalization (e.g., Heine et al. 1991; Hopper and Traugott 1993; Bybee et al. 1994). And/or it questions the assumption (e.g., Heine 1993) that auxiliaries are necessarily forms on their way from a purely lexical to a purely grammatical status. Heine (1993: 77) very cursorily mentions the possibility of a development from auxiliary into adverbial forms, quietly suggesting it is an exception. But, at least in West Germanic, this developmental route seems the rule rather than the exception. Admittedly, these developments usually involve modals in combination with other linguistic elements, i.e. they usually concern 'univerbations' (Hopper and Traugott 1993: 135ff, e.g.). Yet one can hardly say that the original modal plays a subsidiary role in the resulting form. It is not merely present as a cliticized remainder attached to a dominant stem. On the contrary, it is usually (at least one of) the most central element(s) of the resulting form. (Cf. also van der Auwera and Plungian 1998 for several potential cases of degrammaticalization in the modals.) This is a subject for further investigation.

A question left unanswered so far is why the epistemic modals, if they are non-beneficial from the perspective of iconicity as characterized above, should have developed at all. The more since, at least in Dutch, at the time when this process must have started several alternative epistemic expression types were available already: the epistemic uses of the mental state predicates and some epistemic adverbs, including *misschien* 'maybe',[4] already existed in Middle Dutch, and other adverbial and adjectival forms, including *waarschijnlijk* 'probable/probably', developed soon after, before the onset of the development of the epistemic meaning in the modals (cf. MW and WNT). Part of the story may be the aim to have an alternative for the adverbs, with the same functional profile, so as to allow a division of labor

4. It is remarkable that this adverb, which derives from a phrase centrally involving *mogen* 'may', seems to have had an epistemic meaning right from the start, i.e. at least 4 centuries before the source modal itself. The other adverb and adjective deriving from *mogen*, *mogelijk* 'possibl(e/y)', however, also existed in Middle Dutch already, but with a predominant dynamic and secondary deontic meaning (which still exists, but is minor now), while the epistemic meaning seems to have developed around the same time as the epistemic meaning of the modal auxiliary.

when simultaneously expressing several qualifications (cf. Section 4.6). But there is no doubt more to it: the development of the epistemic modals most probably does involve an element of iconicity, yet in a way different from the above.

To see how this works, we should first note that the development of epistemic meanings in the modals is not an isolated phenomenon. It is part of a systematic and long-term process of forming grammatical markers for most major qualificational categories in West Germanic (and elsewhere). The preexistence of alternative lexical expression types may be of no particular relevance for this. This wider process not only involves the modals, but all auxiliaries. The modals themselves are exploited in function of the most important qualificational domains: among the auxiliary verbs in Dutch they are the major means for expressing deontic and epistemic modality, but they also participate in the expression of evidentiality (cf. *moeten* 'must'), tense (cf. the temporal meaning of *zullen* 'will', 'shall'), and aspect (the dynamic reading of ability is essentially a type of qualificational aspect, and some other readings here included under dynamic modality, such as the habitual reading of *kunnen*, involve quantificational aspect). Aspect and tense are otherwise mainly handled by other auxiliaries (in combination with verb morphology), and evidentiality by verbs which are not real auxiliaries, but which are supportive or dependent anyway (they are strictly speaking copulas: e.g., *lijken* 'seem', *blijken* 'appear'). Thus, all auxiliary verbs together cover practically all major qualificational domains occurring in languages. In this perspective, the observation that the modals express the meanings they do express (cf. Section 4.1c) is not even very extraordinary or surprising anymore.

This process may be due to the gradual loss of morphology in the West Germanic languages, which caused the disappearance of other grammatical forms allowing the expression of these qualificational notions. Irrespective of the lexical means available, this loss apparently needed to be compensated for in a way which fits in with the general non-synthetic (analytic) tendency of these languages, i.e. by means of a more 'syntactic' grammatical marker. Relevant for the epistemic (and deontic) meaning may be the gradual disappearance of the subjunctive through the Middle Dutch period as an effective means of expression. Although this cannot be solely decisive: languages such as German, French and Spanish still use the subjunctive (even if it is clearly in a process of decay in them) yet have developed

epistemic modals nonetheless. Of course, in these languages the subjunctive is a dependent marker of modality, i.e. bound to subordinate domains and dependent on the nature of the main clause (with limited exceptions, at least in Spanish, cf. Lunn 1995). So the modals and the subjunctive are, or have become, complementary.

Now this general trend to have grammatical expressions for nearly all major qualificational categories may be due to iconicity in the sense that these categories are so conceptually elementary and systematically recurrent that humans feel the need to code them directly into linguistic structure proper. This is no doubt enhanced by the fact that each of these qualifications is a semantically closed class, having a limited range of possible values (unlike the object domain of states of affairs in the world, which is practically unlimited in variation). They are, thus, applied time and again to ever-changing states of affairs, making their major values deeply entrenched (cf. Talmy 1988b). This offers another reason why these values should tend to enter the linguistic code proper. Maybe, this also helps to explain why spatial situation is one of the rare qualificational dimensions not coded in auxiliary verbs in West Germanic: while most other qualificational dimensions, including time and epistemic modality, are 1-dimensional, space is a 3-dimensional domain, so it is much more complex and less easy to systematize in a few key values.

In sum, conceptual structure and information structure are very crucial elements in determining the syntax of epistemic expressions. In the course of the syntactic developments as characterized above, then, also the other functional factors get their chance to enter the game and influence it. Thus, the need to express (inter)subjectivity and to make descriptive uses possible no doubt created a, or another, niche for the mental state predicates and the adjectives. For, a descriptive use requires an expression which commands its own tense marking and subject, so that they can be set to non-first person and non-present. That is, it requires an autonomous verbal or at least predicative expression type. Similarly, the expression of (inter)subjectivity requires a form type which commands a first person vs. impersonal subject, and/or (for intersubjectivity) an expression with a categorial nature (e.g. a non-verbal predicate supported by *be*). In the mental state predicates subjectivity is arguably part of the lexical semantics, but even this development has no doubt occurred only because of the possibility of the form type to command a first person subject.

In none of these cases is the presence of a syntactic feature enough to automatically trigger the correlated functional factor, however. Thus, a complementing pattern does not automatically bring along focal uses, witness the complementing modals. Or being an autonomous predicate as such is not enough to trigger descriptive uses, as the parenthetical mental state predicates and possibly the complementing modals show. And an impersonal pattern does not automatically trigger an intersubjective reading, as, again, the complementing modals possibly show. This demonstrates that syntactic patterns, even if probably not entirely independently from the lexical elements figuring in them, have a symbolic value, too, which they must develop and which must get conventionalized. This is one of the major tenets of Construction Grammar (Fillmore 1988; Fillmore et al. 1988), but a procedural grammar (cf. Section 1.2b) will have to find ways to deal with this, too. The fact that descriptivity and (inter)subjectivity did get conventionalized in many epistemic forms shows, then, that they are not just accidental or completely secondary features either.

One factor which stands quite apart from all of this is discourse strategy. Strategic uses graft themselves onto the semantic characteristics of form types, employing them to achieve special interactive purposes. But this factor does not trigger or require special structural features in/of the expression types of its own. This goes to show that this functional dimension has a quite different status as compared to the other dimensions, and it will have to be treated as such in a theoretical account (see Section 6.5).

In conclusion, then, our paradigmatic analysis of epistemic expression types offers an excellent illustration of how, diachronically, language is shaped and continuously reshaped, and of how, synchronically, its use is steered by a dynamic interaction of a multiplicity of functional factors (see Section 1.1; cf. Dik 1986; Nuyts 1992b). Linguistic research cannot do without functional analysis, but any simplistic concept of functionalism in terms of a direct one-to-one mapping between function and form is equally bound to fail. The general function of language is communication. But communication is a highly complex process, involving very many different dimensions at many levels of analysis (Nuyts 1993b). Each of these dimensions imposes its own requirements on structure and use, and these requirements are not always mutually compatible. Hence the linguistic system is constantly torn back and forth between them in a never-ending dynamic process of adaptation. Specifically in the domain of epistemic modality, in

diachronic development the pressure exerted by the different functional requirements has resulted in a number of alternative structural solutions. Hence synchronic use is characterized by multiple mapping relations between multiple functional dimensions and multiple forms, turning the speaker's steps from the former to the latter into a complex decision process.

With these general reflections, we are ready for some theoretical considerations ensuing from the investigation. As forecast in Section 1.3, our radically functionalist paradigmatic analysis should offer us an interesting starting point to dwell on the issue of the cognitive infrastructure for language use. So let us see what we can harvest. Let me first set out a few beacons for the discussion. Section 6.2 briefly outlines the 'Functional Procedural Grammar' concept of language production, which implements the theoretical view laid out in Chapter 1, and which provides a frame of mind for our considerations. Section 6.3 introduces the theoretical concept of 'hierarchical' or 'layered' representation of qualificational categories, which will figure centrally in our theoretical account.

6.2 Language production: A blueprint

In line with the tenets of the cognitive-pragmatic perspective (cf. Sections 1.1 and 1.2), Functional Procedural Grammar (FPG — De Schutter and Nuyts 1983; Nuyts 1989, 1992b: 256ff)[5] aims to blend the basics of traditional functionalist modeling of language structure, in which it originates, with a general dynamic procedural concept of cognition more typical of language psychology. It thereby unavoidably adjusts and/or deviates from elements of either discipline. FPG attempts to offer a global encompassing overview — a 'blueprint' — of the process of language production, from the level of conceptual representation onwards. It tries to comprehensively feature the full variety of notions, structures and procedures deemed relevant for understanding linguistic behavior, and to conceive of their possible organization in the cognitive systems responsible for this behavior.

It should be clear from the outset that this proposal is not a 'model' in the classical sense. In the common ideal in language research, a model is

5. The following is a summary overview. For more details, see the references given.

formalized as much as possible from its conception onwards, the formalism then being maintained and elaborated in the light of — or, quite often, against — new data. FPG is not formalized, and there is no intention to do so at present. Rather, it is a provisional and tentative sketch, meant to be altered and gradually filled out in more detail as our insights increase. In the mean time it should serve as a heuristic device for investigating linguistic phenomena. One may want to criticize it for being programmatic (cf., e.g., Sinha 1994; De Bustos 1995), but that is missing the point, since the model is explicitly intended to be such, for principled reasons (Nuyts 1995a). Our current understanding of many parts and dimensions of the cognitive structure of language is so limited that it is simply premature to aim to be specific about them. Formalizing them not only masks our ignorance, but also holds a high risk of causing mistaken views. Still, as argued in Section 1.2, we need to reserve a place for these aspects and dimensions in our models in order to remain aware of them and be able to take them into account in our analyses. Moreover, featuring them also means thematizing them for investigation. This is not a common concept of a model, but probably it ought to be.

Figure 6 offers a global overview of the model. Italicized notions are names for series of procedures, which result in types of representational

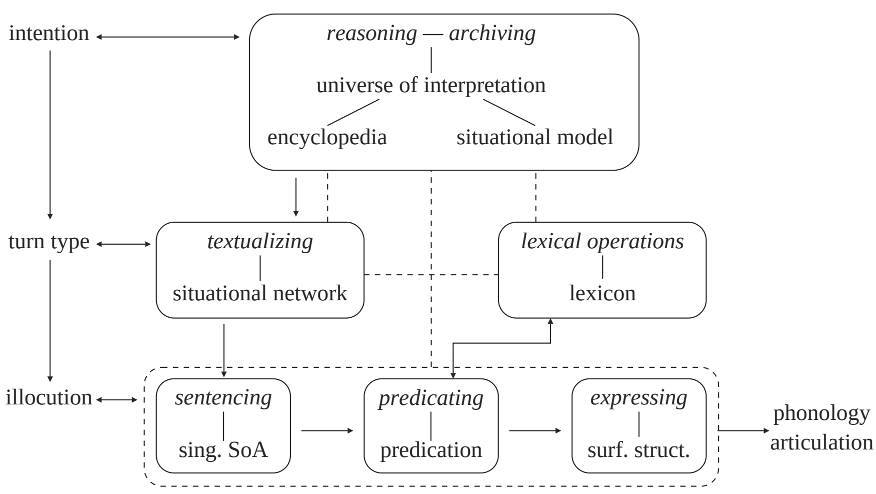


Figure 6. *Language production in Functional Procedural Grammar*

structures specified in normal typeface. The similarities with views on language production commonly held in language psychology — and particularly with Levelt's (1989) model, which is a synthesis of them — are immediately obvious. The present 'textualizing' system more or less corresponds to Levelt's 'conceptualizer', and Levelt's 'grammatical encoding' (as part of the 'formulator') is here subdivided in 3 subsystems, viz. 'sentencing', 'predicating' and 'expressing'. (The levels of 'phonological encoding' and 'articulation' in Levelt's model are not covered here.) Both views start out from the speaker's general situational and world knowledge (the 'universe of interpretation' in the present model), and assume a separate yet within the system very crucial 'lexicon': linguistic coding appears to a large extent lexically driven. At a more fine-grained level, however, the present view does differ from classical language psychology, and from Levelt's model in particular. This is first of all due to the adoption of views regarding utterance structure and processing common in functional linguistics. One important source of inspiration is Dik's (1978, 1989a, 1997a, b) Functional Grammar, but the present view is not bound to this model and draws from many other functionalist frameworks as well. Another source of deviance from classical language psychological modeling concerns the strongly interactive and flexible view of processing in different areas of the system (see Section 1.2b and below).

FPG assumes that conceptual representations are essentially non-linguistic, even if it is currently not possible to specify the format in positive terms (see Section 6.4). Moreover, it assumes that a substantial part of processing in language production is performed in terms of those non- or prelinguistic structures (cf. Section 1.2a). Of course, even such non-linguistic processes aim towards linguistic realization, hence there is probably no sharp dividing line between prelinguistic and linguistic processing, unlike what is often assumed in psychological models, including Levelt (1989).

As indicated, behind the production process is the speaker's 'universe of interpretation', i.e. a cover term for a complex set of knowledge domains and accompanying processing mechanisms for archiving and reasoning with knowledge. It includes at least two systems. (i) The encyclopedia, i.e. the inventory of long-term conceptual knowledge about the world in its widest sense (including the social and the mental — see Section 1.2), of which relevant parts are activated by the actual communicative setting. (ii) A situational model, i.e. a temporary structure containing information acquired

through perception of/in the actual communicative situation, of which parts considered important will be transferred to the encyclopedia for permanent storage. The situational model includes a 'hearer model', i.e. a model of the hearer's present knowledge and attitudes, based, among others, on the contents of what (s)he has already contributed to the ongoing discourse. The universe of interpretation is not only central to communication, though, but presumably to all human activity (cf. Section 1.2a).

The universe of interpretation not only provides a direct input to the language production process, as the source for information (knowledge) about states of affairs to be expressed in language. It also provides an indirect input, in that it is consulted time and again during the process to make all kinds of decisions about how to code that information about states of affairs linguistically. For those decisions are not uniquely determined by that information proper, but depend on other contextual knowledge as well. For example, social knowledge, i.e. knowledge in the universe of interpretation about general social rules and conventions and about one's relationship with the interlocutor, is drawn upon all through the process: when selecting information to be expressed (cf. taboo's, socially unacceptable topics, etc.), when choosing lexical material for expression (cf. levels of formality of one's language), when deciding about forms of address and politeness strategies, and even when deciding on the kind of pronunciation (cf. social accents, sloppy vs. articulated speech, etc.). Whence the interactive view of processing. This kind of link between systems is indicated in Figure 6 by means of dotted lines connecting boxes.

The incentive to start speaking is due to an intention regarding some state of affairs in the speaker's universe of interpretation (the double-headed arrow between the two in Figure 6 indicates their mutual dependency), plus a communicative intention. (On the structure of intentionality, see Nuyts 1994. I will not go into this here.) In the course of language production, the communicative intention triggers specific types of turns at the discourse level, and illocutions at the single utterance level.

The first level of representation specific to the production process, from which it actually starts and on which it works, is the 'situational network'. Like the universe of interpretation, this structure is supposedly non-linguistic, conceptual, though the format of representations at the two levels may have to be different (see below). It integrates all information about states of affairs the speaker is planning to utter in one conversational turn or narrative

or textual thematic unit. Thus, normally the information in it requires coding in several consecutive utterances. But its actual size varies with the circumstances: a conversational turn can be very short, even just one word, while in a narrative, a monologue or a written text a thematic unit can be quite long.[6] While the information in it is being produced, the structure serves as the 'bookkeeper' (cf. Levelt 1989: 110ff) for the ongoing stretch of discourse. When all of it has been uttered, the structure is cleared out again, but even afterwards there must be some 'bookkeeping' of what has been uttered.

The situational network is thus a temporary structure, construed for the purpose of the communicative process only. So it probably uses relatively short-term memory and working space, like the situational model in the universe of interpretation. This is unlike the encyclopedia, the lexicon, and the knowledge of the procedures for processing language, which all require long-term memory space. And it is unlike the representations formed later in the production process, which probably only require very short-term memory and working space.

The situational network is construed by means of 'textualizing' procedures. They prepare the information for production by adapting it to the current communicative situation, in view of the speaker's situational model, and in view of his/her intention (which at this level leads to the specification of a turn type, i.e. the discourse-level counterpart for the illocutionary mode of a sentence). Probably, this already includes taking into account the possibilities of linguistic coding of information, which would mean, at least, that at this level information is purely propositional. E.g., it will probably not contain any types of information which can only be rendered visually, or in terms of any other non-linguistic type of perceptual or behavioral system. Depending on the precise format of information in the universe of interpretation, this may make the nature of representation at this level different from the latter. This level may thus more or less embody what Slobin (1991, 1996) has coined 'thinking for speaking'.

Textualizing involves at least two major types of procedures, viz.: (i) Procedures for selecting parts of the information about relevant states of

6. But probably there is a limit to the amount of information the situational network can contain, and if thematic units are too long, they may be handled in consecutive situational networks, whereby each is connected to the previous ones by the bookkeeping system (see below).

affairs in the universe of interpretation to be encoded in the current turn, and for integrating them into a coherent conceptual structure. And (ii) procedures for determining information structure, in terms of dimensions such as thematicity, given (or old) vs. new, and contrastiveness. Presumably, the procedures in (i) also take into account the status of information in terms of different qualificational dimensions such as aspect, tense, types of modality, etc., i.e. the matter which actually concerns us in this monograph. In earlier presentations of FPG, determining the qualificational status of information was considered a third set of textualizing procedures. Yet it is more plausible to consider this a matter of operations performed over conceptual knowledge in the universe of interpretation, and not something performed solely for the sake of language production (although this process must take qualifications of information into account, of course). No doubt, communication often triggers (re-)consideration of the qualificational status of information. But still, this concerns either the information in the situational model, or one's long-term stored information, and it can be taken to be performed by the general reasoning mechanisms operating over these kinds of information.

When actually producing linguistic utterances, then, the conceptual representations in the situational network are processed by three major procedural systems, viz. 'sentencing', 'predicating', and 'expressing'. These systematically code the conceptual structures into linguistic utterances, i.e. together they perform the process of verbalization of conceptual information. They more or less correspond to what is classically called 'grammar', whence the dotted box around them in Figure 6.

The sentencing system is no doubt the most complex one, although its impact may vary considerably depending on the size of the situational network. In view of the contents of the situational network, of the speaker's intention with specific parts of the information (at this level translated into the illocutionary force), and of the situational model, it produces representational units called 'singular states of affairs'. Each one of these contains the information to be expressed in one individual utterance. At least at this level, information has the representational format of relational structures consisting of entities specified for semantic roles and linked by semantic relations. But it is presumably still prelinguistic. How to model semantic roles and relations is an open question (see Nuyts 1992b: 274ff). (This kind of representation may be needed in the situational network already, though.)

Sentencing involves at least the following types of procedures, all of

which are decisive for creating coherence in the ensuing discourse: (i) Procedures for isolating in the situational network chunks of information suitable for expression in one sentence, and for determining the order in which these chunks can be produced (i.e. linearizing them). This includes rendering logical relations between consecutive chunks when necessary. (ii) Procedures for organizing each chunk internally into a self-sufficient information unit, yet in relation to the other singular states of affairs (e.g., making cross-references whenever needed). This obviously includes adopting the relevant qualificational markings of information in the situational network. And (iii) procedures for determining the topic-focus structure of the information unit, obviously again in function of the linear order of the information (cf. matters such as topic continuity and topic shift).

Predicating involves converting the singular states of affairs into linguistic representations. Its output is a 'predication', which has the format of a syntactically still unordered valency structure of the type commonly accepted in functional linguistics (cf., e.g., the predication in Functional Grammar — Dik 1978, 1997a). Predicating strongly draws upon the lexicon, i.e. the inventory of lemmas, which includes not only words, but also idioms, fixed expressions, etc. Each lemma carries a lexical frame specifying its argument structure and other information about how it can be used in a syntactic pattern (cf. the predicate frame in Functional Grammar). It also carries a pointer to its meaning in the encyclopedia. Lexical entries are moreover subject to lexical operations, e.g. to productively derive complex lemmas, for adjusting valency patterns, etc. (cf. predicate formation in Functional Grammar). Procedures in the predicating system include the selection of a predicate which can appropriately bind the central roles in the singular state of affairs, of terms to fill the argument positions of the predicate, and of additional terms and adverbial and grammatical materials and markings to express all remaining dimensions of the singular state of affairs (including qualifications of information, obviously). Another procedure is the specification of syntactic functions (at least subject and object), among others in function of the topic-focus structure of the singular state of affairs.

Finally, expressing transposes the predication into the surface structure of an utterance, ready to be fed to the phonological coder and the articulator. This system covers the traditional domain of syntax. It involves at least: (i) Word ordering procedures, which to a considerable extent draw on standard construction patterns (cf. the 'syntactic inventory' of templates proposed in

Role and Reference Grammar — Van Valin and LaPolla 1997). (ii) (Inflectional) morphological procedures. And (iii) intonation assignment procedures.

In the following discussion, then, this framework will serve as our orientational map, while at the same time certain dimensions of it will be further substantiated.

6.3 Qualifications and layered representations in functional linguistics

Specifically in view of our concern with qualificational categories, an important source of inspiration as well as object of critical reflection will be the notion of 'hierarchical' or 'layered' representation. This construct has gradually emerged over the last few decades, in the context of analyses of qualifications such as tense, aspect and modality. Its aim is to account for the status of these qualifications as meta-operators over states of affairs relating to each other and to the internal organization of (the linguistic representation of) the state of affairs in specific ways. In essence, this type of representation goes back to the 'p(x)' notation used in logic to represent operators ('p' — e.g., quantifiers, negation, propositional attitudes) over propositions ('x'). In modern linguistics, this kind of notation has been introduced at least since the semantic turn in the generative paradigm (see also Premper 1991). Thus, Fillmore (1968) introduced it in the form of a 'modality component' in his case frames, without developing it though. And Ross (1970) and Lakoff (1970) introduced it in the form of an illocutionary predicate at the highest level in the underlying representation of a sentence (the 'performative hypothesis'), using it to handle the speech act type of the utterance. The need for sophistication in this kind of representation has been recognized at least since Seuren (1969), who started to deal with scope relationships between operators co-occurring in an utterance, and to order them on that basis.

Lyons (1977) was among the first to introduce the idea of layered representation in post-generative functional linguistics, by distinguishing between modal qualifications in terms of the dimension of a state of affairs which they affect (the 'it-is-so' vs. 'I-say-so' levels — cf. Section 2.1). Especially since the late seventies, however, the extreme complexity of qualificational categories and their interactions has drawn increasing attention from functional linguists, resulting in substantial language-specific and

typological research. This has led to the conviction that behind the cross-linguistic variation there is a trend for the different categories to show a stable pattern in how they relate to each other and to parts of the state of affairs (i.e. their relative scope), grammatically and semantically. They presumably form a more or less universal ordered list such that categories higher in the list affect categories lower in it, but not vice versa, and such that each category affects a specific and going down the ordered list gradually more restricted domain of the (linguistic expression of the) state of affairs (e.g., the full state of affairs or clause, the core participants or arguments, the predicate). This idea is now quite widespread in functional linguistics, and it has so far resulted in two substantial hypotheses regarding how to integrate a hierarchical system of layers of qualifications in a functional grammar model, viz. in the context of Van Valin's Role and Reference Grammar and of Dik's Functional Grammar.

There is also at least one proposal for a type of layered representation in the psychological literature, viz. in Johnson-Laird's (1983: ch.15) mental models theory. This proposal has not been inspired by a linguistic concern with qualifications, but rather by the concern in philosophical logic with propositional attitudes. Hence, unlike the proposals mentioned above, it does not concern linguistic representation but conceptual representation. Unfortunately, this model has remained very elementary and sketchy to date.

Let us take a closer look at the Role and Reference Grammar (RRG) and Functional Grammar (FG) proposals for layered representation, as I will refer to them repeatedly in the remainder of this chapter.

a. *The layered structure of the clause in Role and Reference Grammar*

This proposal is the earliest of the two, but has also undergone most changes and extensions since its conception. It was originally introduced in Foley and Van Valin (1984), first modified in Johnson (1987) and Van Valin (1990, 1993), and most recently slightly modified and elaborated in Van Valin and LaPolla (1997). In the latest version, this model introduces a layered representation at two levels, viz. in syntactic structure and semantic representation. At both levels, it distinguishes between 'operators' as grammatical expressions and adverbs as lexical expressions of qualifications. Only the representation of operators in syntactic structure is fully developed (this was the only dimension present until Van Valin and LaPolla 1997). The treatment

of adverbs in syntactic structure and of operators and adverbs in semantic structure is still rudimentary and provisional.

Figure 7 offers a simplified sketch of layered structure at the syntactic level (e.g., it omits structural positions such as pre- and postcore slot and left- and right-detached position, which are not essential for our concerns). In Foley and Van Valin (1984: 208ff) operators were directly integrated in syntactic clause structure, but from Van Valin (1990) onward they constitute a separate hierarchy which is ‘projected’ onto clause structure. That is, syntactic structure consists of different projections, including the (basic) constituent projection and the operator projection. (There is also a focus projection, which I leave aside here. But see Section 6.5.) There are two reasons for separating operator and constituent projection. First, operators are not part of constituent structure, but modify (parts of) it. Second, from a typological perspective, constituent order is extremely variable but operator order appears remarkably universal (but see below).

At the center of the constituent projection (the left side of Figure 7) is the predicate (usually a verb), which forms the ‘nucleus’ of the sentence. The nucleus and its obligatory argument(s) together constitute the ‘core’, which is modified by the ‘periphery’, containing optional prepositional phrases (e.g. locatives, instrumentals, etc.) and adverbial elements. The predicate is also the center of the operator projection (as is rendered by the line from V in the

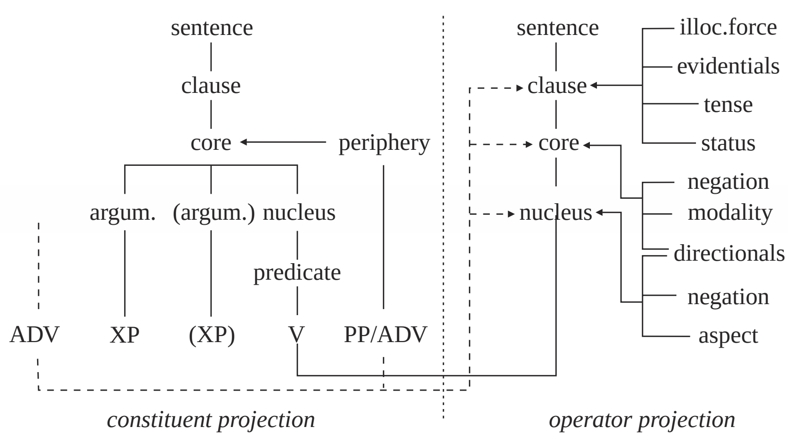


Figure 7. *Layered syntactic clause structure in Role and Reference Grammar*

constituent projection to the operator projection on the right side of Figure 7). In this projection, ‘status’ stands for epistemic modality plus polarity (or ‘external negation’, as Van Valin calls it), ‘modality’ corresponds to what is elsewhere called root modality, ‘negation’ at the core level is ‘internal negation’, and negation at the nucleus level is predicate negation. As indicated, each operator in this projection has a specific syntactic level in its scope, only directionals can affect two levels. And each higher operator in the list has each lower one in its scope. The relative order of operators is considered to be fairly strict, but there may be some cross-linguistic variation: e.g., in some languages tense and status may switch positions (Van Valin and LaPolla 1997: 46). It should be stressed that the operator projection in RRG is a syntactic structure: the ordering of the categories of operators is intended to represent the syntactic ordering of grammatical expression forms for these operators in languages (e.g., the order of appearance of affixes on the verb).

The situation of qualificational adverbs is less clear. Their representation in Figure 7 is tentatively derived from Van Valin and LaPolla (1997: 162ff). They do not offer a taxonomy of qualificational adverbials, and the integration of these forms in the system is only illustrated with a few examples. Adverbs figure both in the constituent projection, as they participate in the ordering of sentence constituents, and in the operator projection, as they modify clause structure and have mutual scope relations, quite like operators. In the constituent projection, adverbs may belong in the periphery, but may also attach to any component of clause structure (nucleus, core, clause), depending on which part they modify. The unattached dotted line upward from the leftmost category ADV in Figure 7 may thus lead to any of the higher nodes. What motivates the distinction between adverbs in the periphery vs. directly attached to the core node is not obvious. E.g., Van Valin and LaPolla (1997) present temporal adverbs as peripheral, but ‘pace’ adverbs such as *slowly* as directly attached to the core node, i.e. as sisters of nucleus and arguments.[7]

7. The present concept of a periphery in RRG has been adopted from earlier versions of the model, when there was no treatment of adverbials in terms of their scope yet, hence the entire set of optional constituents was simply considered to affect the core. In the logic of the new version it would probably be better to make the notion ‘periphery’ more global, covering all adverbials (as well as prepositional phrases) irrespective of the node to which they are attached.

In the operator projection, each adverb has scope over a specific layer of clause structure, corresponding to the layer to which it relates in constituent projection. E.g., aspectual adverbs have scope over the nucleus, temporal adverbs over the core (as they are peripheral adverbs), and evidential adverbs over the clause. Presumably, this scope normally corresponds to the scope of the semantically corresponding operator. Yet there are exceptions, including the temporal adverbs, as tense is a clause operator (I return to this later). The hierarchical ordering of adverbials (co)determines their ordering in surface structure. RRG also postulates that semantic interactions between operators and adverbials limit the ordering of the latter, but these dimensions have not been developed yet.

Semantic structure in RRG is decompositional. Its principles are not important here, but in this structure, adverbs are one-place predicates which take the part of semantic structure which is in their scope as their argument. Operators are represented in a similar way, although Van Valin and LaPolla (1997) do not claim they are one-place predicates, and leave their status open. This leads to a linear structure in which adverbs and operators (intermingled, depending on their relative scope) and elements of the representation of the state of affairs occur in a flat consecutive order representing their semantic relations, as illustrated in (275) (slightly simplified from Van Valin and LaPolla 1997: 171).

(275) a. Joshua evidently has been singing slowly
b. $\langle_{\mathrm{IF}}$ *DCL* (**evident** $\langle_{\mathrm{TNS}}$*PRES* (**slow** $\langle_{\mathrm{ASP}}$*PERF PROG* ⟨**do** (Joshua, [**sing** (Joshua⟩]))⟩⟩⟩)⟩

Predicates expressing qualificational categories have not been dealt with in the model yet, neither in syntactic nor in semantic structure.

b. *Hierarchical clause structure in Functional Grammar*

The layered clause model was introduced in FG more or less simultaneously by Hengeveld (1988, 1989, 1990, 1992a) and Dik (1989a, 1997a, b). It was inspired by Foley and Van Valin's (1984) original layered clause model in RRG. Dik's and Hengeveld's versions, though fully commensurate in their essential properties, deviate in a number of respects. E.g., Hengeveld treats

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To signal their peripheral status, the attachment could be marked by a special type of link. Van Valin (pers.com.) appears inclined to accept such an approach.

illocution as a predicate, as in Lakoff's (1970) performative hypothesis (see below), but Dik treats it as an operator, as in RRG. I will present Hengeveld's proposal here, since it is the most widely accepted version in current FG.

Like RRG, this proposal primarily deals with grammatical expressions of qualifications, also called 'operators', and with lexical expressions in optional constituents (primarily adverbials and prepositional phrases), here called 'satellites'. But it also accounts for predicates expressing qualificational categories, or rather, for the nature of the complements of such predicates (see below). Unlike in RRG, however, layered representation is introduced at only one level, viz. in the 'predication' (in the FG sense), which is the basic representation in the grammar. It is formed on the basis of the 'fund' (i.e. the lexicon plus rule systems for predicate and term formation), and after syntactic and pragmatic function marking it is input to the 'expression component' which produces a surface linguistic expression (see Dik 1989a, 1997a on how the layered representation figures in FG).

Figure 8 presents a considerably simplified overview of Hengeveld's proposal, omitting dimensions not relevant for the present purpose. Apart from several notational simplifications, it omits term operators, figuring within the constituents in the argument slots, which are of no further concern here (see Rijkhoff 1990). It also omits clause satellites, i.e. 'the lexical means through which the speaker locates his/her utterance within the context of the discourse and thus restricts the set of potential perlocutions of this utterance' (Hengeveld 1989: 151). This is a fairly obscure category, and Dik et al. (1990) seem to have integrated it in the category of illocutionary satellites.

This layered representation is organized at two main levels, which are purely semantically motivated. The lower, 'representational' level is concerned with the narrated event, i.e. the real or hypothetical state of affairs to which the utterance refers. The higher, 'interpersonal' level concerns the speech event, i.e. the speaker's presentation of the state of affairs in view of his/her communicative intention toward the listener. Both levels are structured similarly, viz. in terms of a valency pattern, and both contain two more layers. The representational level is structured on the basis of the predicate frame, consisting of a predicate (pred) and arguments $((x_1) \dots (x_n))$. It contains the layer of the terms, provided with the referential variable (x_i), which refer to individual entities in the world, and the layer of the predication, provided with the variable (e_i), which refers to a state of affairs in the

clause

interpersonal $(E_1{:}[\pi_4\ \text{ILL: (S) (A)}\ (\pi_3\ X_1{:}\ [\text{proposition}]\ \sigma_3)\ \sigma_4])$

representational $\pi_2\ e_1{:}\ [\pi_1\ \text{pred}\ (x_1)\ldots(x_n)\ \sigma_1]\ \sigma_2$

predication

Predicate operators (π_1) and satellites (σ_1): additional properties of the SoA
- π_1: qualific. aspect ((im)perf., inchoative, progressive, etc.), predicate negation
- σ_1: additional participants, manner, spatial orientation

Predication operators (π_2) and satellites (σ_2): setting of the SoA
- π_2: tense, quantif. aspect (iterative, semelfactive, etc.), object. modality (epistemic and deontic), polarity
- σ_2: spatial and temporal setting, setting relative to other SoAs (cause, co-occurrence, condition, reason, purpose)

Proposition operators (π_3) and satellites (σ_3): validity of the propositional content
- π_3: subject. modality (epistemic, boulomaic), evidentiality (infer., quotat., exper.)
- σ_3: propos. attitude, validity of proposition (source, evidence, motivation, condition)

Illocution operators (π_4) and satellites (σ_4): communic. strategy of the speaker
- π_4: mitigation or reinforcement of illocutionary force
- σ_4: manner of speech act, communicative setting of speech act

Figure 8. *Hierarchical clause structure in Functional Grammar*

world. The interpersonal level is structured on the basis of the illocutionary frame, consisting of an illocution (ILL) and as its arguments the speaker (S), the addressee (A), and the propositional content. This level is thus identical to Lakoff's (1970) highest level of deep structure representation in generative semantics. It contains the layer of the proposition, provided with the variable (X_i), which refers to a potential fact, and the layer of the clause, provided with the variable (E_i), which refers to the speech act.

At several points in this structure, sets of operators ($\boldsymbol{\pi_x}$) and satellites ($\boldsymbol{\sigma_x}$) are attached. The overview of operators in Figure 8 is based on Hengeveld (1989), that of satellites on Dik et al. (1990). The satellites listed are a selection of the most important categories for our purpose. As indicated in the overview, the clustering of operators and satellites, and the determination of their point of attachment, is semantically motivated, in terms of what they

'do' to the state of affairs, the proposition or the speech event. In line with the general idea behind layered representation, it is assumed that layers of lower complexity are fully contained within layers of higher complexity, hence lower-level operators and satellites are within the scope of higher-level ones.

As mentioned, FG also accounts for complementing predicates expressing qualifications (Dik and Hengeveld 1991; Dik 1997b: 93ff). These predicates are not equated with the semantic categories of operators and satellites in Figure 8. And they could not, in the philosophy of the model, because they necessarily go to the 'pred' position in view of their syntactic status. But their status as qualifiers is rendered indirectly, by limiting the hierarchical build-up of the clause contained in their complement. The highest level in the complement clause is the one at which the qualification expressed by the predicate should be situated. Thus, a predicate expressing a qualification at the predication layer (e.g. objective epistemic modality) has a complement with (e_i) as the highest variable. A predicate expressing a proposition layer qualification (subjective modality, evidentiality) has an (X_i) complement. And a predicate expressing a (mitigated or reinforced) speech act (a performative) has an (E_i) complement. Also in these cases, the assumption is obviously that operators and satellites in the complement are within the scope of the qualification expressed by the main clause predicate.

The validity of the principle of layered representation to account for the behavior of qualifications in language can be taken for granted by now, and in the following I will draw heavily on this concept. On the one hand, this will add a perspective 'in breadth' to our 'in-depth' investigation of one qualificational category, epistemic modality, allowing us to situate the present findings in a wider context and to evaluate better their significance. Simultaneously, these findings may contribute to our understanding of the position and format of layering in the cognitive systems for language use. The considerable divergence in how FG and RRG, despite their theoretical closeness, conceive of layering is a symptom of our poor grasp of the matter, the apparent sophistication of these proposals notwithstanding. As will appear in the following, even our investigation of one single qualificational category in a few familiar languages poses problems for both proposals as they stand. This is no doubt at least in part due to the fact that both models oversimplify the matter. For both clearly conceive of it from a classical view of linguistic grammar, viz. without explicit concern with the cognitive

implications, and specifically, with the embedding of the issue in the wider context of human mental functioning — 'depth' — and its procedural dimension — 'dynamism' (cf. Section 1.2). From a cognitive-pragmatic perspective and its implementation in FPG in Section 6.2, however, the issue of layering must be considerably more complex than envisioned in these models.

So, let us now turn to the theoretical interpretation of our findings. I will first address the matter of the nature of human conceptualization in general (Section 6.4). In the light of this I will turn to the position of epistemic modality and layering in language production (Section 6.5), and in conceptual structure (Section 6.6).

6.4 The epistemic paradigm and the nature of conceptual representation

First of all, our investigation is clearly consequential for the discussion regarding the nature of conceptualization. As mentioned in Section 1.2, there is a long tradition in the human sciences to postulate a close relation between thought and language (Dascal 1996). Also in recent attempts to develop more specific models of conceptual structure, especially scholars of language (to the extent that they worry about the issue) have put forward propositional types of models which are more or less closely inspired by the format of natural language. In contradistinction, in the exposition of FPG in Section 6.2 and elsewhere I have conjectured that conceptualization is non-linguistic, and maybe even non-propositional. In fact, our analysis of the epistemic paradigm offers a clear argument at least against a strongly language-based view of conceptualization. The argument at the same time supports our intuition formulated in Section 1.3 (see also Section 6.2) that epistemic modality is not just a linguistic phenomenon but a basic conceptual category. Let me first state the argument and then consider some wider implications for modeling conceptualization.

6.4.1 *The argument for non-linguistic conceptualization*

In order to be able to spell out the argument, let us first consider how to deal with the different epistemic expression types in lexical representation, which serves as the basis for their handling in syntax. The following is cast in

terms of the functional concept of the lexicon in FPG (or FG, for that matter), but is probably quite non-controversial in general.

a. *Mental state predicates*

As full verbs, the mental state predicates must be considered basic lexical entries. As argued in Section 3.1, the qualificational reading, at least for the best established forms, appears to be fully structuralized and independent of the non-qualificational reading. So at least in these cases these verbs must be considered to have separate lexical entries for the qualificational and mental-state-or-process readings. The complementing and parenthetical variants of the qualificational predicate are reasonably considered alternative syntactic realizations of one lexical frame. In a traditional concept this would have to be the complementing one, the parenthetical use being based on valency reduction of the complementing frame (the job of a 'lexical operation' — cf. Figure 6 in Section 6.2). But in Section 6.5.5 I will suggest an alternative approach to the lexical structure of these predicates. I will not deal with the question how to handle the dimension of grammaticalization presumably related to parenthetization in defining the lexical status of these forms. (But see (c) below on grammaticalization and the lexicon.)

b. *Adjectives and adverbs*

Less obvious is the relation between the adjectives and adverbs. Some consider adverbs and adjectives (like nouns and verbs) separate 'parts of speech' (e.g. Hengeveld 1992a, b), some consider them structural variants of one lexical category (e.g. De Schutter and van Hauwermeiren 1983). But most often the issue remains untouched. Adjectives are traditionally considered one of the basic lexical categories, jointly with verbs and nouns, but the status of adverbs often remains unclear (cf. Ramat and Ricca 1994). It is beyond the present scope to exhaust the matter, but here are some considerations.

Since English marks adverbs vis-à-vis adjectives (by means of the suffix -*ly*), one might be tempted to think that, whenever there is lexical overlap between the two categories, the adverb is productively derived from the adjective by means of a lexical operation. The more so since one can, when needed, creatively use the morphological marker to form new adverbials (not only from adjectives, actually). There are a few objections to such an approach, however. First, in Dutch and German the distinction between the two categories is (a few exceptions apart) not marked, so at least in those

languages the appeal of the proposed solution is less strong. Second, if the diachronic considerations about Dutch in Section 6.1 (cf. (274)) are adequate, then it is the epistemic and evidential adjectives which have historically developed out of the adverbs, rather than vice versa. (This does not mean the development cannot go the other way around in other cases, of course.) Third, as pointed out in Section 2.1, even within the range of epistemic forms, and even in English, while there is considerable lexical overlap between the two categories, there are also numerous adjectival and adverbial forms which have no counterpart in the other category. The same is true for adverbs and adjectives other than epistemic ones. This means that sometimes the derivation must be blocked, and that one needs adverbial next to adjectival lexical entries anyway.

Probably, the most plausible solution is to assume (more or less in line with De Schutter and van Hauwermeiren 1983) that adverbs and adjectives are essentially variants of one lexical class, the 'A-class', individual members of it differing in the syntactic configurations in which they can figure. That is, their lexical frame specifies whether they can be used predicatively, attributively (term adjectives), or adverbially. Forms which can be used in more ways can be assumed to carry alternative lexical frames, just like verbs with different syntactic possibilities. This obviously does not preclude the existence of a lexical operation of abverbialization, which under special conditions can be used for the creative formation of new adverbs from different kinds of input (adjectives, but also nouns or even verbs). Just like there are lexical operations for adjectivization, nominalization, and even verbalization. Language users appear to know how to transform one word type into another, and occasionally they apply this knowledge.

c. *Modal auxiliaries*

The auxiliaries constitute yet another problem. In many linguistic approaches, including FG, purely grammatical markers (plural markers, diminutives, agreement markers, etc.) are treated as a separate category of forms which are introduced in linguistic structure in the course of syntactic derivation. They are not included in the lexicon. Since the auxiliaries are grammatical markers with morphological independence (and an increasing one, considering the complementing uses), it is not absolutely obvious whether they should be handled as full-fledged verbs with an independent lexical entry, or rather as purely grammatical morphemes, or as something in between (see

Goossens 1985a, b, 1987 for discussion in the framework of FG). We obviously touch upon a very fundamental issue here: how should one handle the very gradual and slow process of grammaticalization in a model, without postulating radical, hence empirically implausible, jumps from one linguistic category — full verb — to another — grammatical morpheme. Again, this is not the place to go deeply into this matter. But a solution to the problem, at least partially, would be to assume that grammatical morphemes are stored in the lexicon just like normal lexemes. After all, just like normal lexemes, grammatical markers have meaning (even if to varying degrees: markers of qualificational categories are obviously more meaningful than an agreement marker or *do* as a grammatical supportive element) and are characterized by syntactic restrictions (again to varying degrees, but always much more strongly than normal lexemes — this is precisely one of the defining characteristics of grammaticalization). These have to be rendered somewhere in the grammar anyway. So why not in the same way as for other lexemes? The gradualness of syntactic and morphological sclerosis in grammaticalizing forms can then simply be understood as a gradual change in the phonological form and the syntactic occurrence restrictions (the lexical frame) of an item in the lexicon.

For certain modals (e.g., English *ought*, Dutch *kunnen*, German *können* — see Section 4.1) there is obviously the complicating factor that their epistemic use is probably not independent but a special use of the deontic or dynamic form. Although for *kunnen* and *können* this is only partly true, viz. for the sentence-internal uses. Their complementing uses are probably independently established. This issue is not really consequential for the following, so for the sake of simplicity I will tentatively assume that modals do have a lexical status, their special syntactic position being rendered in their lexical frame. For Dutch and German *kunnen* and *können*, e.g., this means that they have an entry for the epistemic meaning with a predicate frame for the complementing use. The sentence-internal epistemic use can be taken to draw on the dynamic entry in special contexts. How this should be worked out in detail is a matter for another occasion.

With these observations in mind, we can now formulate the argument regarding the nature of conceptualization. There are two premises: First, since the different epistemic expression types all involve the same core notion of epistemic modality, they must unavoidably all have their cognitive

origins in one and the same core level, which is the site or locus of the speaker's epistemic evaluation of a state of affairs (cf. Section 1.3). From this one level (s)he works his/her way to an expression form via procedures sensitive to the other functional factors, as schematized in Figure 3 in Section 4.6. Second, from the above discussion it follows that the major categories of expressions in the epistemic paradigm, and probably even some of their alternative lexical frames (the adjectives/adverbs and the complementing/basic auxiliaries), are lexically basic, hence basic in terms of linguistic representation in the grammatical apparatus. So they cannot be productively related to any other linguistic form, at least not synchronically (in spite of the diachronic relations between some of these form types — cf. Section 6.1).

Combining these two premises, the conclusion must be that the level which forms the site for the epistemic evaluation of the state of affairs cannot have the format of any of these linguistic alternatives. Otherwise, one would have to derive the other forms from this one in the course of language production, and that is completely implausible (see also Nuyts 1993c). Imagine, e.g., that one would take the adverbs, functionally and structurally the most neutral form in Dutch and German, as the core form. It will be self-obvious that one would have to invoke very radical transformational operations, including lexical exchanges, to go from this form to an expression with a clause-internal auxiliary or a complementing mental state predicate. From a functional and cognitive perspective such types of grammatical operations are completely implausible, for various fundamental reasons which have been elaborated among others in Dik (1997a: 19ff) and Nuyts (1992b: 190ff). Also language psychologists do not consider transformational rules to be a plausible syntactic device anymore (cf. Bock et al. 1992; Bock and Levelt 1994: 962).

The fact that there are diachronic changes from one expression type into another obviously does not affect this argument. In diachrony this involves a slow process of gradual reinterpretation of one structure type into another, and that is obviously quite different from the kinds of fast processes at work in language production. On the contrary, the observation in Section 6.1 that functional dimensions, including the conceptual status of the qualification, diachronically override the borders between expression types only adds to the argument, since this means that those functional factors are prior to and essentially independent of the specific linguistic expression types.

Consequently, we have strong reasons to assume that the level which is the locus of the epistemic evaluation cannot have a format using lexical items of the language, or anything closely resembling it, as a representational device. And for those who had not accepted this on the basis of intuitions and reason alone, we now have a formal argument that epistemic modality is not a specifically linguistic, but a more basic, presumably conceptual, phenomenon. In other words, we have a legitimation for the conjecture in FPG (cf. Section 6.2) that the site for epistemic evaluations is the universe of interpretation, and that this level of representation operates in a non-linguistic code.

This conclusion is further strengthened by the fact that it can easily be extended beyond the phenomenon of epistemic modality. Exactly the same reasoning can be developed for most or all other major qualificational categories. For they too show paradigms of linguistically fundamentally different expression types. As Figure 8 in Section 6.3 shows, there is a remarkable correspondence between the categories of grammatical (operator) and adverbial (satellite) expressions, not only in terms of global semantic divisions (even if the layers in FG are not without problems — see Section 6.6), but even in terms of individual qualificational categories. This parallelism also extends to complementing predicational (verbal and adjectival) expressions (cf. Dik and Hengeveld 1991; Dik 1997b: 93ff). Thus, if we disregard the boundaries between layers in the FG proposal for the moment, not only epistemic modality, but also evidentiality and deontic modality occur (sometimes in terminological disguise) in the operator, satellite and predicate categories. And time and types of aspect feature as operators and as satellites (again sometimes under different labels). And even space should probably not only occur in the satellite category, but also as an operator: cf. the directionals in the RRG proposal. Presumably, then, in each of these the speaker's choice among the alternative expression types is also due to factors beyond the qualification at issue. And the qualification as such should function as a coherent semantic notion at a level deeper than and representationally different from the linguistic categories expressing it. Like for epistemic modality, this conclusion perfectly matches intuitions: it stands to reason that conception of time, or an estimation of moral or social acceptability or desirability, or an understanding of types of sources of information, are not just relevant to linguistic behavior, but to human cognitive functioning

quite in general. They must be basic dimensions of human conceptualization.[8]

One element which complicates this reasoning is that, conceptually, a semantic category such as epistemic modality cannot simply be equated with a representational category. It does not represent some state of affairs, it qualifies or evaluates one. Hence it does not originate in a representational structure of the kind involved in one's knowledge of things in the world. Rather, its origins is an operation over knowledge representation (see Section 6.6). Still, what is rendered by epistemic or other qualificational expressions is obviously the result of this evaluation process, and not the process itself. (What should it mean to linguistically render the process?) That is, they render a conceptual representation of the outcome of the process. And for that representation, the above argument is fully valid.

In fact, the argument can also be extended to paradigms of expressions of conceptual domains which are squarely within the range of representations of states of affairs. A typical case is Fillmore's (1977) commercial event frame (see also Kay 1996). (Aspects of) this conceptual domain can be expressed by means of many different verbs, with different lexical frames, including those in (276) (cf. Fillmore 1977: 103; square brackets indicate that at least one or a few of the optional constituents must be realized).

(276) a. Harry bought the puppy (from Mr. Smith) (for $60)
b. Mr. Smith sold the puppy (to Harry) (for $60)
c. Mr. Smith sold Harry the puppy (for $60)
d. Harry spent $60 on/for the puppy
e. Mr. Smith charged [(Harry) ($60) (for the puppy)]
f. The puppy cost (Harry) $60
g. Harry paid [(Mr. Smith) ($60) (for the puppy)]
h. Mr. Smith priced the puppy at $60

All these alternatives go back to one and the same conceptual scene. They are derived from the latter through different perspectivizations resulting from several factors, including information structure (although this particular one

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8. The fact that FG, for good linguistic reasons, cannot integrate qualificational uses of predicative expression types in the layered system in a way which makes them comparable to semantically corresponding adverbials and operators (see Section 6.3b) further underscores the fact that linguistic structure is the wrong 'vehicle' to render the basic semantic dimensions involved.

is not mentioned by Fillmore). Alternative lexical frames for each of the verbs may at least in part be derived by means of lexical operations. But the different verbs and their lexical frames clearly cannot be linguistically derived from each other, for the same reasons as stated above with respect to the epistemic paradigm. Hence, the commercial scene itself cannot be conceptually represented in terms of lexical elements such as involved in (276).[9] One can adduce numerous other similar cases, e.g. the *give*/*get*-scene, the *employ*/*work for*-scene, the *rent*/*let*-scene, etc. And comparable arguments can be made for lexical categories other than verbs, such as related nouns from a single lexical field, e.g. of the *father*/*son* type. (Cf. Fillmore 1977, 1985, Nuyts 1990c, 1992b: 223ff, and Kay 1996 for examples.)

There are, of course, numerous other types of arguments militating against a linguistic view of conceptualization. E.g., experimental research on the memory for verbal form vs. meaning shows that normally only the latter is retained. Phenomena such as word finding problems, amnesia, etc. suggest a cognitive difference between linguistic forms, stored somewhere, and the meaning of those forms, stored somewhere else and more readily available. Translatability between languages requires a level of meaning independent of the forms assigned to it in specific languages. Since these and other arguments have been elaborated at length elsewhere (e.g., Nuyts 1990c, 1992b: 223–236; Jackendoff 1996; Levinson 1997), I will not go further into them here.

6.4.2 *Further thoughts on modeling conceptualization*

If the above argument holds, a radically linguistic model of conceptualization such as Dik's (1987a, 1989b) obviously cannot be correct. In his view (cf. Section 1.2), conceptual representation has more or less the format of the underlying predications postulated in FG, i.e. it is built up from predicate

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9. Fillmore (1977) does not explicitly draw this consequence himself — his purpose was not the nature of conceptualization but the question how to develop a lexical semantics. But the conclusion is immanent in his entire theory of frame or scene semantics. Hence, he construes a mental model-like representation to render the conceptual scene of the commercial event. And see Fillmore (1985) for more explicit statements on the extra-linguistic status of conceptual frames.

frames of actually occurring lexical elements of the language as specified in the lexicon. In this model each of the sentences in (276) would go back to a different conceptual structure, featuring a different predicational relation between entities, in correspondence with the surface predicate and terms. Only (276b-c) are an exception sharing one conceptual structure. So this proposal does not allow for one integrated conceptual representation grasping the commercial event as a whole. Likewise, assuming that Dik would consider qualifications to be present in conceptualization,[10] most or all expression types in our epistemic paradigm would have to be traced back to a different conceptual representation. There is no place in the model where epistemic modality or any other qualificational category can be represented as one conceptual notion. It is hard to see, however, how this could be plausibly reconciled with the fact explicitly acknowledged in FG that different qualificational expression types can effectively be grouped together in terms of coherent semantic categories (see Section 6.3b and 6.4.1 above): what is the ontological status of these semantic categories supposed to be, then?

To solve this problem, Dik would probably revert to his notion of a 'functional logic', i.e. a system responsible for reasoning (cf. Dik 1988), arguing that a language user can logically derive each of the alternative forms in a semantic paradigm from any of the others. This is a strategy he has explicitly proposed for cases of the type in (276), more specifically for the *employ*/*work for* alternation (Dik 1987b). This will hardly do the job, however, since it still does not introduce a place in the model where the semantic category (the commercial event, epistemic modality, etc.) is represented as such. In fact, it is hard to see how this solution can work if a language user does not have knowledge somewhere of the commercial event scene or epistemic modality itself. For what would be the premises on which to base the logical derivation? Even worse, there does not seem to be anything logical to the relation between the alternatives at all, in the sense

10. Dik himself did not make clear statements regarding the conceptual status of qualifications. One element which might possibly contradict my assumption is that Dik assumes that the layered representation is constructed in the course of language generation in FG (cf. Section 6.3b), and some parts of it are built up even after syntactic function assignment (cf. Dik 1989a: 53, 1997a: 60), while syntactic functions are (obviously) explicitly **not** relevant for conceptual representation in Dik's view. Yet, as argued, the assumption that qualificational notions do not figure in human thought, but only get introduced when one starts speaking, would seem highly implausible.

that it would require a real reasoning syllogism. The difference between them is entirely a matter of taking different perspectives on one and the same event, quite like the difference between an active and a passive clause (see Nuyts 1992b: 226ff). No one would ever consider to relate the latter by means of reasoning, and there is no reason why this should be otherwise for the relation between the variants in (276) or in our epistemic paradigm.

In sum, maintaining a strictly linguistic view of conceptualization would force one to give up the idea that one meaning category implies one conceptual notion or domain. This is a theoretically completely implausible step, of which the consequences are immense. Ultimately, it means giving up meaning as a coherent notion which constitutes the core of what language use is all about. This goes to illustrate the point made in Section 1.2a (in fine) that adherence to a radical anti-abstractness dogma, of which Dik was a fervent advocate, is not maintainable even from a strictly functional perspective.

The argument in 6.4.1 also seems to militate against modeling conceptualization in terms of more abstract predicate-argument style propositional representations, of the kind proposed by Jackendoff (1983, 1987, 1990), however. On the one hand, Jackendoff's (highly sophisticated and well developed) theory is driven by the assumption that syntactic structure and semantic or conceptual structure (he equates 'semantic' with 'conceptual') cannot be too far apart if there are to be systematic correspondences between them. He calls this the grammatical constraint on semantic theory (Jackendoff 1983: 13ff). On the other hand, unlike Dik, Jackendoff strongly advocates a decompositional type of semantic representation, arguing that meaning structures are composed out of a fixed, universal, and innate set of semantic primitives, even if of a type completely different from classical semantic features. These primitives, and the structures built up from them, are then obviously non-linguistic.

I am not sure how Jackendoff would deal with the alternatives in our epistemic paradigm: qualificational categories in general remain largely unexplored in his framework. It does not seem to easily allow for one common conceptual representation for all of them either, though. This would require the introduction of one abstract element, possibly a function category (in his technical usage of this notion). But it is not obvious how this category

could be attuned to the syntax of the different expression types so as to meet the grammatical constraint (see above).[11]

Jackendoff does offer a treatment of some of the alternatives in the commercial event paradigm in (276), however. It takes into account the fact that predicates such as *buy*, *sell* and *pay* involve an exchange, i.e. a transfer of goods as well as a 'countertransfer' of money in which the participants and participating objects have alternative roles. This entire cluster is part of the 'lexical conceptual structure' of all these predicates, thus capturing the intuition that also the elements and relations in the counterpart of the exchange are implicitly present in each, even if they are not mentioned in the utterance. E.g., when hearing that *Bill bought the book* one knows that he bought it from someone by paying some amount of money to that person. The cluster is present in a different way in each predicate, however, depending on what is realized syntactically. In *buy* the transfer of goods is the syntactic core of the utterance. Hence in its conceptual structure this is the foregrounded event, coded as the main conceptual 'clause'. The countertransfer of money, as the backgrounded event, is embedded in a modifying conceptual clause marked by a 'subordinating function' called 'exchange'. In *pay*, however, the countertransfer is syntactically central, hence foregrounded, so in its conceptual structure the two events switch positions. *Buy* and *sell* do have the same main and subordinate conceptual clause, but they are assumed to have a different 'extrinsic instigator' (marked by a 'cause' function): the 'from'-participant in the main transfer in *sell*, and the 'to'-participant in the main transfer in *buy*. (See Jackendoff 1990: 189ff for details.)

Characterizing the difference between *buy* and *sell* in terms of a different causer of the action does not seem to be the correct approach, however. One can perfectly well imagine situations in which the action is described in terms of *buy* although it is the seller who took the initiative, hence is the causer. And vice versa. As Jackendoff states, the two predicates differ in the perspective they offer on the exchange. But this perspective is probably not so much a matter of inherent semantics (causation), but rather of information structure, it depending on which participant happens to be the local or

11. Our observations clearly are a problem for the RRG decompositional semantic representation, since adverbials and operators are distinct elements in it. But I am not sure whether Van Valin would consider these representations to be identical to conceptual representations.

discourse topic and/or which the focus of attention. Of course, Jackendoff cannot use these notions since they are not available in his theory. From a cognitive-pragmatic perspective, this is a systematic problem for his model. More generally, also with reference to the difference between *buy* and *pay*, although Jackendoff's representations clearly come closer than Dik's to revealing what is conceptually shared by the alternative expressions, his conceptual semantics still does not offer a level to directly represent what they share, as such.[12]

To render the concept of the commercial event scene as such, then, both models could consider reverting to a completely different type of representation, viz. an image-like one. In fact, Fillmore (1977) also renders the scene in an analog format. Dik acknowledges that some knowledge must be represented in a perceptual or image-like mode, but he is not specific about its format or role vis-à-vis his lexical conceptual structures. Jackendoff does substantially integrate vision-based '3D models' (inspired by Marr's 1982 3D structure) as a central representation type in cognition (see Jackendoff 1987). And he considers conceptual and 3D structures to be equally central to the representation of information.[13] But he also postulates, to some extent, a division of labor between them. Thus, he (1990: 33–34) argues that there is no need to differentiate in conceptual structure between entities such as a

12. In this respect his proposal does not appear to reach a sufficient degree of generalization. But in other respects it does not seem sufficiently discriminating. Thus, Jackendoff's conceptual structures do not allow one to differentiate *sell* and *give to X for Y*, as in *John sold the book to Mary for $50* vs. *John gave the book to Mary for $50* (cf. Jackendoff 1990: 191, 194). Yet intuitively these are not fully equivalent in meaning: the latter does, but the former does not suggest that it was a bargain for Mary. One would expect to see this difference rendered in the conceptual representation underlying these forms, since, unlike the difference between *buy* and *sell*, it is not merely a matter of a different discourse perspective.

13. At least, the argument for an equal status is put forward in Jackendoff (1987: 193ff). Jackendoff (1983) still raised the impression that he considered his conceptual structures to be **the** representational format of long-term information, and even in Jackendoff (1987) and thereafter one sometimes finds statements which appear to suggest their predominance: e.g., "if long-term memories are stored predominantly in the form of conceptual structures …" (1987: 290). In any case, there can be no doubt that 3D and other representational formats (cf. his treatment of musical structure) take a very central role in Jackendoff's view of and concerns with human cognition. And there is also no doubt that Jackendoff is one of the few theorists so far who explicitly dares to venture into the way the multiple modalities of human perception and behavior diverge and relate, and should be integrated in a model of human cognition.

duck and a goose, or a chair and a stool, or between activities such as run, jog and lope, or throw, toss and lob. This would in fact be very hard to do in a propositional format. But these differences all concern the shape of the entities and activities, and this can be perfectly represented in terms of 3D structures. One can easily add examples to the list: colors, e.g., obviously do not differ in shape but in other physical properties, but 3D structure could probably be adapted fairly easily to accommodate such dimensions.

Reverting to an image-based representation to grasp the ultimate meaning of these different phenomena would have serious consequences, however. At least for them, it implies that not the conceptual structures in Dik's or Jackendoff's models, but these image-based representations constitute the central level of conceptualization. Dik's predicational and Jackendoff's semantic representations would at best be downgraded to 'no more' than intermediary structures formed in the course of language production. It is even the question whether Jackendoff's semantic representations are still needed at all. Predicational representations are needed, of course, since they are the lexical structures on which the linguistic processes operate. Now it is not farfetched to argue that internal consistency and systematicity demand that the primacy of imagistic representation be generalized: whenever information can be rendered more readily in this format, it should be, rather than in a propositional format. And this probably applies to many things expressed in language, witness the systematic use of image-like representations to render meaning in Langacker's (1987) Cognitive Grammar. Thus, Jackendoff (e.g. 1987: 202ff) assumes considerable duplication of information between conceptual representation and 3D structure, e.g. regarding spatial relations. Why would it not suffice to have this information stored in 3D structure only, which is the more obvious means for it?[14]

But it is problematic to use image-based representation to render the commercial event scene. There is a quite substantial difference between it and phenomena such as the distinction between a duck and a goose (and others mentioned above), in that the former, but not the latter, contains elements which clearly go beyond purely vision-based perception. The actual

14. It is not hard to see that yet other representational systems are needed, next to an image-based structure, to grasp the ultimate meaning of yet other linguistic expressions: e.g., *sour* and *sweet* require recourse to olfactory representations, *sticky* to a tactile one, etc. See below.

transfer of objects and coins or bills of money between subjects is, of course, purely physical, hence visually perceptible. But the notion of possession, or of money as a cultural institution, obviously are not. Yet these are crucial elements of our understanding of the commercial event. Also, the physical acts involved in the commercial event scene can be extremely variable: payment can be via a bank transfer or credit card instead of cash, one can trade for natural goods, or buy through a mail order company, etc. The commercial event as such is not captured by any of these physical realizations in particular (though some of them may be more prototypical for the act in general than others, of course). Moreover, some of those physical realizations are equivocal as to their status: the difference between buying and renting something may involve exactly the same physical activities, yet they clearly differ on the issue of possession. And exchanging goods as a trading act may look exactly the same as the mutual returning of objects which the interactants had borrowed from each other, but the latter is clearly not an instance of the commercial event.

In fact, as Fodor (1975) and Jackendoff (1987: 198ff) have adduced before, a very basic feature of knowledge, even vision-based, is the type/token distinction, or more generally the principle of abstract generalization over concrete instances of a phenomenon, and this clearly goes beyond what can be rendered in a strictly vision-based 3D structure. Thus, as Jackendoff (1996: 10f) argues, the conceptualization of any specific act of killing — stabbing, strangling, hanging, shooting, etc. — could be rendered in a visual image. But the concept of killing as such, which can involve any of these actions but is not specific as to which one, appears too abstract to be rendered in a format close to a visual image. More or less the same situation applies to the commercial event scene as discussed above.

Of course, 3D or imagery representation is not adequate to render the concept of epistemic modality at all, for there is nothing visual or image-like to epistemic evaluations of states of affairs: likelihood is never and in no way inherent to, or an object of visual or any other type of perception. (Even the state of affairs subject to the evaluation is not: epistemic judgments concern hypothetical states of affairs, which therefore cannot have been perceived.) The same is obviously true for other qualificational categories such as time or deontic modality.

Jackendoff uses the issue of generalization as an argument for the plausibility of his conceptual structures (cf., e.g., Jackendoff 1983: 77ff on

how to deal with types/tokens and categorization in his conceptual semantics). But our discussion of what is required to represent the conceptualization of epistemic modality or the commercial event scene rather pushes us into assuming a more abstract type of representation, at least for these two phenomena, and, in the spirit of systematization, maybe for the domain of abstract knowledge in general. As discussed in Section 1.2, human information processing is multimodal, involving different perceptual and behavioral systems, some of which are functionally at least as important as and physiologically much more basic than language. So it is a matter of pure reason to assume one central conceptual system serving all these behavioral and perceptual systems, which is not uniquely determined by any of those systems, and especially not by language. A small further step is to assume a 'cognitive simplicity postulate' (Nuyts 1992b: 223ff), viz. the idea that all conceptualization basically operates in terms of one central representation type which extends beyond any mode-specific representation. The above discussion, then, clearly supports the plausibility of a sophisticated variant (see below) of this postulate. In terms of the FPG in Section 6.2, this would be the representational mode of the universe of interpretation, and more specifically of the encyclopedia.

Both Dik (1989b) and Jackendoff (1983: 17 — cf. his 'conceptual structure hypothesis') accept this idea of one unified level and format of conceptual representation. But it is paradoxical that they then postulate the simultaneous existence of quite different representational formats which seem difficult to conjoin in one system, viz. at least pictorial or imagery and lexical or language related propositional ones, without assuming a more abstract system behind them. Jackendoff (1987: 236ff) even goes beyond these to postulate, among others, a basic cognitive system of 'body representations', which can presumably be used to deal with emotions or character traits, and which he considers to be clearly separated from his conceptual structures. Of course, one can keep on adding separate cognitive systems and corresponding representational formats for each new knowledge domain one encounters. And there are no doubt quite many such domains. In a strictly modular approach, such as Jackendoff's, this may seem legitimate. But in the light of the above discussion it appears much more plausible to assume that all these types of knowledge, at a sufficient level of abstractness, flow together into one more integrated and probably more uniform conceptual system.

This is not to say that there is no long-term information storage in terms of representations more closely related to the different perceptual and behavioral modes, in support of the central conceptual system. Vision-based concepts as discussed above are a good case in point. One no doubt stores knowledge of what a goose or a cat is in terms of a 3D-image, even if probably at some level of abstraction, in terms of a prototypical instance of the category. One probably does not store images of individual geese or cats, unless one happens to have one as a pet. In that case one has a representation both of a prototypical cat and of the specific cat one knows. One's general concept of pets or animals, however, is, beyond such images, represented in the more abstract central conceptual system, yet no doubt with reference to the images of specific types of pets or animals.[15] Similarly for the commercial event (or, in a parallel fashion, the act of killing — see above). One no doubt has more or less abstract 3D-representations of individual types of commercial transfers, even if not of individual tokens of them, unless one happens to have experienced very special ones which one cannot forget. And one has a more abstract knowledge representation of the principles of a commercial event, which, however, also refers to the specific types of forms this can take. We can add examples at random, from widely diverging domains. Even cultural and social knowledge no doubt has its roots at least in part in visual perceptions. One's knowledge of politeness, e.g., must include imagery representations of types of things to do in types of situations (e.g. how to behave at a dinner table), but more abstract principles of politeness are represented in more abstract terms. An example from a completely different domain is emotions: one no doubt has a sensory representation of types of feelings (e.g. of how it feels to be in love, to be angry, etc.), but the principles behind these emotions, or the concept of emotion as such, are probably coded in the central conceptual system.

15. Much or most knowledge of objects actually requires representations in the range of more than just one perceptual system. One not only knows what a typical cat looks like, but also how it smells, and how it feels. Similarly, one not only knows how garlic tastes, but also how it smells (and these two are in my experience far from identical, pace Jackendoff's 1987: 51f claim to the contrary), what it looks like, and how it feels if one touches it.

Yet another illustration, from the domain of kinesthetic information storage, can be found in Keller and Keller (1996).[16]

In this view one may wonder whether at least some information is not also stored in linguistic or language-related form. Johnson-Laird (1983), e.g., strongly advocates the role of language as an at least temporary intermediary storage system. Of course, trivially, there is considerable long-term storage of linguistic information, viz. of the grammar of language (its lexical material, syntactic patterns, etc.) And, surely, one can store world knowledge in a linguistic format if one wishes to: one can learn texts by heart. But, as noted in Section 2.1, there is one radical difference between language and systems such as vision, taste, smell, motor activity, etc. The latter are all physiologically basic, primary, non-symbolic domains of information processing. They offer information directly, without mediation. The perceptual image of a cat or a goose is identical to what, informationally, a cat or a goose **is**. Language, however, is a physiologically non-basic, symbolic system of information processing. It offers information in an indirect, mediated way, coded in a conventional system tapping in or parasitizing on the possibilities of the primary systems of auditory or visual perception and motor behavior. Thus, words such as *cat* or *goose* are in no way identical to the information what a cat or a goose is, they only refer to that information. (In a way, lexemes as such, as forms, including information on their grammatical behavior, are the closest match in linguistic representation to the visual concept of a cat and its behavior, or the olfactory concept of sourdough, or the sensory concept of anger.) This difference makes it far from obvious that there would be knowledge representation in a (near-)linguistic format, similar to the visual knowledge representation of a cat or a goose.[17]

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16. Such cases throw a shadow on an abstract kind of model of conceptual representation such as Johnson-Laird's (1983) mental models theory: it is not obvious at all how such a type of representation would be able to handle (generalizations over) non-vision-based knowledge. For, though mental models theory aims to be an abstract representational system (see Section 1.2a), it is still quite strongly related to imagistic representation.

17. One empirical way to investigate this would be to systematically go through a dictionary of a language and check whether there are any entries which refer to information which cannot be captured in terms of knowledge representation in the format of one of the basic perceptual and behavioral systems or generalizations thereof, and which do not (like epistemic modality and other qualificational categories) require recourse to an abstract level of representation to render their basic meaning in such a way that all linguistic instantiations of it can be grasped.

Of course, none of this shows what the format of the postulated central conceptual representations might be. Even in global terms, it remains open whether they should be called propositional or not. (Of course, the answer depends in part on how one defines ‘propositional’, an issue which is not absolutely obvious either.) These issues, as well as how the above considerations could be substantiated and implemented in a full-fledged model of the architecture of the conceptual system, will require much more multidisciplinary research than is available at present. In the meantime, let us see how much further our present investigation can take us in understanding at least some dimensions of the problem.

6.5 Epistemic modality and layering in language production

So, it looks like linguistic and conceptual structure are substantially different in nature, and epistemic modality and other qualifications are not only linguistic categories, but have their roots at the conceptual level. If so, how should we conceive of epistemic modality, and more generally of the layering of qualifications, at those two levels? And where and how should we situate the different functional factors involved in the expression of epistemic modality? And what does all of this imply for our understanding of the levels and their processing in general? The present section will mainly address the global division of labor between the linguistic and the conceptual levels, and will primarily focus on the nature of the linguistic level and the mapping relations between the two levels. Section 6.6 is entirely devoted to a further exploration of the conceptual level.

Two warnings in advance:

– In terms of FPG, talking about qualifications and layering at two levels is obviously an abstraction. Though conceptual representation is, in principle, contained in the universe of interpretation, it extends into the production process up to the point of actual verbalization, with a few transitory stages (the situational network and singular state of affairs) on the way towards linguistic representation. And linguistic representation is a simplification too, since it involves a few levels of structure from the point of verbalization in the predication component to the surface representation fed to the articulator. Obviously, a full account will have

to cover each of those intermediary stages. It remains convenient to talk about ‘two levels’ as long as one keeps this caveat in mind. And, of course, whenever there is need for it, I will use more specific terminology.

– As indicated in Section 6.3, the issue of layered representation allows us to widen the narrow scope of our present investigation to the status of qualificational notions in general. This also means, however, that the following discussion will make assumptions about qualifications other than epistemic modality, and these will often be based on partial, intuition-driven, hence tentative observations which are in need of corroboration by means of further in-depth empirical research.

There are different facets to the discussion, so let’s address these in turn.

6.5.1 *Models of layering and the linguistic vs. conceptual divide*

First of all, one may wonder to what extent the RRG and FG proposals for layered representation introduced in Section 6.3 could serve to model the linguistic and/or the conceptual level. There are reasons to doubt that they can be used in any direct or simple way. The syntactic layered structure in RRG (Figure 7 in Section 6.3) is meant to handle the syntactic behavior of grammatical and adverbial markers of qualifications in languages. So maybe it could serve as a proposal at the purely linguistic level, i.e. pertaining to the expression component in FPG. But it is certainly incomplete, in view of the absence of predicative expressions. The FG layered model is obviously much more semantic (cf. Van Valin 1990: 199ff), as is the semantic layered representation in RRG.[18] This probably means that they feature elements relevant for understanding the conceptual level. But they cannot simply be applied at that level since they also feature structural elements such as the distinction between expression types, which, as argued, only belong to the linguistic level. So it looks like these structures are trying to do too much at one level of representation. In fact, this may even apply to the syntactic

18. The different treatment of layering in RRG and FG is no doubt an effect of the different concept of levels in these models. RRG clearly differentiates between a fairly abstract semantic representation and a syntactic representation which is close to the surface of linguistic expression. FG, however, has only one central level of representation, the predicational, around which everything evolves, hence it is no surprise that this level should blend semantic and syntactic issues.

layered structure in RRG, since it basically duplicates the scope relations in semantic structure. Both the FG and RRG layered models, then, might be illustrations of the problem of 'overcapacity' of grammars mentioned in Section 1.2, which results from lack of a clear cognitive perspective and the corresponding sensitivity for the division of labor between different levels of analysis. But overcapacity in this case also leads to neglect of dimensions and characteristics of the phenomenon which actually do belong in the grammar.

This point is nicely illustrated if we look at a few differences in the actual ordering of qualifications in the two models and compare these with our empirical findings. Regarding epistemic modality, the FG and RRG proposals differ in at least three respects.

a. *Epistemic modality and (inter)subjectivity*

FG distinguishes in the operator range between subjective and objective epistemic modality, situated at the propositional and the predicational level, respectively. But in the range of satellites and (Dik and Hengeveld 1991) complementing predicates there is only one category, at the propositional level, so these presumably always involve subjective epistemic modality. RRG, however, has just one category of epistemic modality ('status'), in the operator range and presumably also in the adverbial range.[19] The issue of sub/objectivity or (inter)subjectivity is not handled in this proposal. Now compare this to our discussion of this dimension in the foregoing chapters.

As argued in Section 1.4, there are good reasons to handle epistemic modality and (inter)subjectivity as two different categories. This means that in conceptual structure we need only one category of epistemic modality, plus a category of (inter)subjectivity, with the former in the scope of the latter. (The position within layering of these qualifications will be addressed in Section 6.6.)

At the linguistic level, however, the situation is much more complex, as Chapters 2–4 have shown. Let me summarize the findings. In the mental state predicates in the three languages considered, the two categories — specifically, subjectivity and epistemic modality — inherently combine in

19. Since RRG has no full taxonomy of adverbials yet, it is not clear whether it would posit identical categories in the operator and adverbial ranges, or would rather allow for some differences between them, as in FG. As we will see, this issue has crucial consequences for the level at which the proposal can be interpreted, however.

one expression form, at least in some lexical items. But not necessarily in the same ones or in the same way in all three languages: recall the difference between *think* and *denken* vs. *glauben*. In the predicative adjectives, epistemic modality also unavoidably combines with an intersubjective or subjective qualification, but this is not a matter of the lexical item per se, but of the selection of a lexical frame and the lexical items filling it (the selection of an impersonal vs. personal subject and/or a specific copular verb, *be* vs. *consider* or *seem*). Epistemic adverbs are entirely neutral as to (inter)subjectivity. And it even appears difficult if not downright impossible to combine them with separate subjectivity markers, such as the adverbial *personally*, or the prepositional phrases *to me* or *in my opinion*: cf. **personally they have probably run out of fuel*, **to me they have probably run out of fuel*, or even ??*in my opinion they have probably run out of fuel*. This contrasts with the verbal and adjectival epistemic expressions, which easily accept additional subjective forms, as observed in Chapters 2 and 3: cf. *I personally think that …*, *it seems probable to me that …* But they only accept these forms in the main clause, not in the complement clause, of course, in line with the scope relation between subjectivity and epistemic modality. Finally, in the auxiliaries, which are the most operator-like epistemic expression type, the combinability with (inter)subjectivity depends on the selection of a lexical frame. The basic pattern is perfectly neutral, and again, it even appears impossible to combine the modal with expressions of subjectivity in the clause: cf. **personally they may have run out of fuel*, **they may to me have run out of fuel*, ??*if you ask me they may have run out of fuel*. But the complementing pattern tends towards an intersubjective meaning, due to the impersonal nature of the syntactic structure.

b. *Epistemic modality and polarity*

At least in the operator range, RRG handles epistemic modality and polarity as two elements of the combined qualificational category ‘status’. FG, however, treats them as two separate qualificational categories in the operator range, and does not feature polarity in the satellite range. Again, compare these with our findings in Chapters 2–4.

As argued, conceptually polarity is part of the epistemic qualification. At the linguistic level, however, different things can happen. Sometimes the polar and scalar dimensions of the qualification are expressed jointly in one form. But especially though not exclusively in the case of a negative polar

qualification, the two are often expressed separately for information-structural reasons detailed earlier. The different expression types offer different possibilities, however, and they even vary between the languages considered. Here is a brief recapitulation. In all three languages considered, an integrated expression of a positive polar epistemic evaluation is obviously possible in any expression type. But an integrated negative polar one is only possible in the predicative expressions, adjectival and verbal, and in the latter even only in the full complementing pattern, not in the parenthetical pattern. There are no negative adverbs or auxiliaries. Dutch and German allow a split expression of a positive or negative polar evaluation by means of a positive or negative polar particle and an epistemic expression in all expression types. But in some there are syntactic limitations: e.g., in a parenthetical mental state predicate the polar marker cannot occur in the parenthetical itself, and some (but not all) modals only allow it in the complementing pattern, and only in the embedded clause. English, however, does not allow a split expression of a positive polar evaluation as easily, since it does not have a positive polar particle. It can only use a strategy such as special stress on the finite verb: cf. *waarschijnlijk heeft hij het wel gedaan* vs. *probably he* ***has*** *done it*. For a negative evaluation, the possibilities in the auxiliaries are quite different from those in Dutch and German.

c. *Epistemic modality and time*

In the satellite range in FG, time is within the scope of epistemic modality. In the operator range, in view of the (mistaken) distinction between subjective and objective modality, time (i.e. tense) is either within the scope of, or at the same level as epistemic modality. RRG, too, situates time within the scope of epistemic modality in the adverbial range (cf. Van Valin and LaPolla 1997: 163). But in the operator range tense has scope over status. But, as mentioned in Section 6.3, Van Valin and LaPolla (1997: 46) admit cross-linguistic variation in this, and even state that “they are roughly equivalent in scope terms”. This relativization is contrary to earlier versions of the model. Once more, let us look at our analyses, and in this case also beyond them, to see what the facts have to say about this.

For the relation between time and epistemic modality, it is critical to keep in mind the distinction between performative and descriptive epistemic expressions. Neither FG nor RRG feature it, though. (The conceptual status of descriptivity vs. performativity will be discussed in Section 6.6.) From the

definition of performativity alone — speaker commitment at the moment of speaking — it is obvious that at the conceptual level performative epistemic evaluations are beyond temporal qualification, i.e. they are at a higher layer than time. Descriptive ones, on the other hand, are per definition within the scope of time.

At the linguistic level, however, the relation between expressions of time and epistemic modality is complex, as is in part obvious from our analyses. In the languages considered, time may be expressed either in satellites or by different grammatical means (morphological markers or auxiliary verbs). All epistemic expression types can combine with temporal satellites. But in performative uses of the complementing verbal or adjectival predicates the time marker obviously must appear in the syntactically subordinate domain (contrary to the subjectivity marking satellites mentioned in (a)), in line with the semantic scope relations. A temporal satellite in the main clause immediately turns the epistemic predicate descriptive. This appears true even if the satellite is compatible with a present reading of the predicate: *today I think that they have run out of fuel* involves a 'description' of my current view (and unavoidably contrastively: it implies that I thought differently at another moment), rather than an expression of the performance of the evaluation. But this is obviously a highly marked situation, whence its absence in my corpus materials.[20]

Van Valin and LaPolla (1997: 164ff) argue that when combining adverbial expressions of different qualifications their relative scope may affect their relative positionability. But in the present case this is not obvious. All variants in (277) are fine. (Dutch (277c-d) are impossible in English. German has more or less the same possibilities as Dutch.) I cannot investigate this now, but the relative position of the adverbs here rather appears determined by information structure, and particularly by whether the temporal adverb belongs to the focal information or not (because it is new or because it is contrastive).[21] But whatever their position, the conceptual scope relation between them remains the same: the alternatives can only mean 'it is

20. One can, of course, also read this utterance with the time marker affecting the state of affairs only, and not the epistemic predicate. This would then be an example of a semiparenthetical use of the predicate, and in this case it obviously is performative.

21. Note that this means that temporal adverbs do not share the property of the modal adverbs that they cannot be focalized. See Section 6.5.3 below.

probable that yesterday they ran out of fuel', but never 'yesterday it was probable that they ran out of fuel'.[22]

(277) a. They probably ran out of fuel yesterday
Ze zijn waarschijnlijk zonder benzine gevallen gisteren
b. Yesterday they probably ran out of fuel
Gisteren zijn ze waarschijnlijk zonder benzine gevallen
c. Ze zijn waarschijnlijk gisteren zonder benzine gevallen
d. Ze zijn gisteren waarschijnlijk zonder benzine gevallen

For combinations with grammatical time markers, let's concentrate on past tense, which has been a recurrent theme in Chapters 2–4. Like temporal adverbs, past tense can combine freely with any performative epistemic expression type as long as it does not affect the latter directly. In the English examples in (277) above, e.g., past tense leaves the epistemic adverb unaffected and is semantically within the latter's scope, quite like the harmonious temporal adverb. (In the Dutch examples pastness is not evoked by a past tense but by a present perfect marker, but otherwise the same is true.) The same applies when past tense on the verb expressing the state of affairs combines with a parenthetical mental state predicate, or when it occurs in the complement clause of a complementing mental state predicate or adjective.

But if a past tense marker does formally affect an epistemic expression, different things may happen. When it is applied to an adjective, as in *it was probable that they had run out of fuel*, it unavoidably turns the latter descriptive. So the tense form remains a time marker, and the epistemic form shifts in conceptual status. As observed in Chapter 3, however, in Dutch, past tense on a mental state predicate, as in *ik dacht dat ze zonder benzine gevallen zijn/waren* 'I thought they have/had run out of fuel' can do two things. Either it makes the predicate descriptive and remains a tense marker. Or it mitigates the epistemic evaluation, i.e. the latter remains performative, but

22. Note that this adds a further restriction to the view that modal adverbs only have scope over the newly asserted (focal) part of the utterance (see Section 1.4c): apparently, this does not apply, at least not straightforwardly, to other qualificational material in the sentence. Moreover, this observation at least complicates the assumption that (in languages such as Dutch or German) the clause-internal positioning of modal adverbs is determined by this scope, i.e. by what is newly asserted in the utterance (see Section 2.4h).

the tense form no longer expresses time but contributes to the epistemic meaning. (The two readings normally select a different tense in the complement clause.) In the parenthetical pattern, however, only the weakening reading is possible. The weakening reading seems somewhat harder to get for the English counterparts. But it is simply impossible in the German counterparts: *ich glaubte, ihnen sei der Sprit ausgegangen* can only express a past evaluation.

For the epistemic modals, however (cf. Section 4.3), the weakening interpretation of past forms is the standard in English, but in Dutch it is highly marginal if not impossible, and in German it is completely excluded. And neither Dutch nor German allows past tense on the modals to be interpreted as a descriptivizer of the epistemic evaluation, as it makes an epistemic reading impossible: the modal then automatically becomes dynamic. Maybe exception should be made for the complementing pattern. For all three languages, this automatically means that, unlike in the adverbial domain, if one wants to jointly express a performative epistemic evaluation and past time by grammatical means, one cannot do so directly, by means of the forms normally associated with these conceptual categories, viz. a modal and past tense marking, but only indirectly, by combining a modal with an aspect marker, the perfect, as in *the ship may have left the port yesterday*.

The future tense marker *will* (like its Dutch and German counterparts) differs from the past tense marker to the extent that it does not have epistemic weakening uses: when it directly affects an epistemic expression, it unavoidably turns the latter descriptive. There is one exception: the weakening effect of past tense on the modals in English (*may* – *might*) and of the Konjunktiv II in German (*kann* – *könnte*) is in Dutch achieved by combining the modal with the preterit form of *zullen* 'will' (*kan* – *zou kunnen*), here called the conditional form of the modal (cf. Chapter 4). In none of these languages can *will* and its counterparts as a future tense marker be combined with an epistemic modal. But on the other hand, this tense marker has developed an independent epistemic meaning in all three languages.[23]

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23. In the light of the foregoing, the RRG view (even the relativized one — see above) that in the operator range tense is higher than status might seem puzzling, particularly also in view of Bybee's (1985: 184) argument, specifically addressing RRG, that across languages of the world tense markers quite systematically occur closer to the predicate than grammatical markers of epistemic modality. The RRG proposal does correctly capture the mitigating use of past

In each of these three cases (a)–(c), then, it is a simple exercise to see that neither FG nor RRG deal with the full range of facts of these languages. And for those aspects which they do handle, both are, at least sometimes, right or wrong depending on whether one relates them to the conceptual or the linguistic level. But these levels are clearly not duplicates of each other. Thus, these cases clearly highlight again a point which has been central to our entire investigation (cf. Section 6.1): the recurrent mismatch, i.e. the absence of a one-to-one mapping, between individual qualifications as conceptual notions and individual linguistic expression forms. Though 'mismatch' is a slightly dangerous notion, since there is a clear system in it, both in terms of its taxonomy and its raison d'être.

Summarizing our various observations, the mismatch comes in two types. One type was the main topic of our empirical investigation and a premise to our argument in Section 6.4 for non-linguistic conceptual representation: one qualificational category can be expressed in several different form types. There are two subtypes of this. One conceptual qualification as a whole can be expressed in alternative linguistic forms, on different occasions, but also in any specific communicative instance by means of harmonious forms, as in *they might perhaps have run out of fuel*. Or different dimensions of one conceptual qualification can receive split expression in two linguistic forms, such as epistemic scaling and polarity. Our investigation demonstrates that these kinds of one-to-more mapping are to a large extent the result of the multifunctionality of language use, i.e. of the interaction of the semantic category with other functional factors. This is true in the case of epistemic modality, but one can plausibly consider this a general principle.

The other type of mismatch works the opposite way: one linguistic expression form can be used by two or more qualificational categories. This, too, comes in two subtypes. Two qualifications may be expressed

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tense, of course, but clearly not the default time marking use of tense. The cause for this problem is no doubt that RRG in a language such as English automatically equates the position of tense with that of the finite verb. In an example such as *he may be leaving soon* it assumes that "tense is the left-most element; that is, because it is a suffix morphologically, it does not appear phonetically as the left-most element, but the syntax treats it as if it were left-most" (Van Valin and LaPolla 1997: 45). The critical question is, of course, whether *may* can be considered a tensed verb form at all. I have assumed it is not. And doing so brings English in line with Bybee's observations on languages which mark both time and epistemic modality by means of affixes.

simultaneously in one form, such as epistemic modality and subjectivity in the mental state predicates. As Perkins (1983) shows, such a combination is far from exceptional. Or two or more qualificational categories may on different occasions use one and the same linguistic form, such as tense serving to mark time or epistemic modality. These kinds of mismatch are clearly not accidental or unsystematic either. The joint expression of two qualifications in one form is no doubt a result of the frequent co-occurrence of the two in certain usage conditions (e.g. subjectivity and epistemic uncertainty in spontaneous conversation). And one form alternating between different qualificational categories is no doubt a by-product of the principle of expressibility, and specifically of the long-term striving for qualificational categories to find expression, whereby expression forms are not created out of the blue.

Thus, in grammatical and probably even in lexical expressions, there appears to be a quite systematic pattern in the double use of forms, which points in the direction of what may be called a 'borrower principle': the default marker for a qualification lower in the semantic hierarchy is borrowed by a qualification slightly higher in the hierarchy.[24] There are numerous clear examples of this, including: the use of past tense to participate in the expression of epistemic modality, or its similar use as a marker for irreality, even independently of other epistemic expressions, common in narratives or pretend play in many languages; the use of the perfect, a marker of aspect, for expressing past time; the use of mood, supposedly a default marker for epistemic modality, for evidentiality in many languages (cf. the quotative uses of the German subjunctive); or the observed cross-linguistic pattern in the meaning development of the modals. To see the hierarchical gradualness of these borrowing uses, one can refer to the position of these different qualifications in the FG or RRG hierarchies in Section 6.3. Borrowing may actually also involve 'non-state-of affairs-representing' categories other than conceptual qualifications. One illustration is the use of mood as an illocutionary force indicator (e.g. in Spanish, cf. Hengeveld 1988). A comparable lexical example is the observed speech act use of epistemic adverbs or mental state predicates in questions. Other cases involve the use of, among others, temporal elements, also lexical ones, as

24. On other occasions I have called this the 'hijacker principle' (e.g. Nuyts 1998).

markers for discourse structure (cf., e.g., Traugott and König 1991). (I return to the relation between illocution and discourse marking and the hierarchy of qualifications in Section 6.6.)

Borrowing is no doubt a synchronic precursor to or signal of diachronic development: the borrowed forms gradually get reinterpreted as markers for the hierarchically higher qualification, and thus they 'wander up the ladder' of the hierarchy of qualifications. Thus, some borrowed uses of forms are much better established than others. For example, in Dutch the use of the present perfect for pastness (besides the regular past tense) is so well established that meanwhile it has been fully reinterpreted as a time marker. But, as observed, the modal *kunnen* in Dutch appears hardly established as an independent epistemic marker yet. This diachronic dimension of borrowing, including changes to/from illocutionary or discourse structuring functions, appears identical to what Traugott (1989, 1995, 1997) calls 'subjectification' (see Section 1.4), hence it is also substantially illustrated by the many case studies, grammatical and lexical, provided in these articles.

Critical for this whole borrowing process, then, is the closeness of adjoined qualificational meanings, which enables the use in disambiguating contexts of a default form for one meaning in function of the other. The discussion of the ambiguity and the process of meaning change in the modals in Section 4.1 may be a representative illustration of how this works in practice, synchronically and diachronically. Of course, it remains a remarkable observation that forms always appear to wander **up** and not **down** the ladder. This must have something to do with the nature of the semantic hierarchy as such, though it is far from clear what. (It is less clear, also from Traugott's writings, whether the changes involving illocutionary or discourse functions show an outspoken tendency to move into or rather out of the qualificational hierarchy as such.) I return to this in Section 6.6.

Now, even as a systematic phenomenon, the mismatch between conceptual qualifications and expression forms underscores, fully in line with the outcome of Section 6.4, that qualifications and layering at the conceptual and at the linguistic level must be quite different things. They probably adhere to fundamentally different principles of organization corresponding to the different nature and role of these levels, viz. the abstract conceptual representation of information in view of its storage for later reuse vs. the linguistic coding of that information for the purpose of communication. If so, then one simply cannot grasp both dimensions in one layered structure in the

grammar, as FG has tried, or in two structures at different places which do little more than duplicate each other, as RRG attempts.

6.5.2 *'Layering' and linguistic structure*

So what should be the division of labor between the linguistic and conceptual levels in a layered account? Our investigation in general, and cases (a)–(c) in 6.5.1 in particular, clearly show that the semantic scope relations between qualificational categories must be formulated quite independently of the behavior of individual linguistic expression types and forms. In the logic of our analysis this means that the former belong entirely at the conceptual level. As I will argue in Section 6.6, also the (differences in) semantic scope of qualificational categories over aspects of the state of affairs, another important dimension of a layered account, probably does not belong in syntax. Both FG and RRG deal with this matter in terms of whether a qualification should be attached to the predicate or nucleus, or to the predication or core, etc. But this dimension of layering follows directly and naturally from the conceptual position of the qualifications relative to the conceptualization of the state of affairs and relative to each other.

At the conceptual level, then, we may assume one integral system of layering of qualifications, fully independent of the peculiarities of qualificational expression at the structural linguistic level. More on this in Section 6.6. At the linguistic level, however, an account of layering is purely a matter of characterizing the structural characteristics and behavior of qualificational expression types and forms, including the procedures for combining and ordering them, mutually and relative to elements expressing the state of affairs. Of course, this behavior is to a considerable extent motivated by, hence crucially requires reference to, the semantics of forms, i.e. the conceptual qualifications they express and their semantic scope. But the way to deal with this is to refer to the procedural links between forms and qualifications at the conceptual level, rather than to duplicate the semantic hierarchy in syntax (as RRG does).

This means that at the linguistic level there is probably very little, if anything at all, left of layered representation, sensu stricto. Not that layering involves no syntax: on the contrary, its consequences for syntax are enormous. Our empirical investigation leaves no doubt about that. But the point is that syntactic representations as such, i.e. those formed after predicating in

FPG, are probably not layered or hierarchical, but ‘flat’, even where they relate to layering in conceptualization. And that corresponds perfectly to the role of syntax in a cognitive-functional perspective, viz. to linearize conceptual information, which is no doubt multidimensional, in view of its communication through an essentially one-dimensional articulatory pattern. (In this perspective it appears quite paradoxical that in the RRG layered proposal semantic structure is flatter than syntactic structure.)

Thus, the effect of conceptual layering in linguistic structure is very disparate. It is linguistic common sense, and Chapters 2–4 have shown, that the different expression types — operators, satellites, predicates — have quite different structural properties. Even within these global categories, groups of forms often have diverging linguistic features: auxiliaries and morphological markers, or adverbials and prepositional phrases, or adjectives and verbs, e.g., are far from structurally or behaviorally uniform. For example, the ordering of grammatical markers relative to the verb, both in strongly affixing languages and in languages using auxiliaries, is quite rigid, while the relative positioning of adverbials in many languages is far from strict (cf. Section 6.5.1c). Also, we have repeatedly observed that individual expression types often render the same conceptual qualificational categories in quite different ways, in terms of making different distinctions, representing different categories, allowing different combinations, etc., for functional and structural reasons independent of the conceptual qualifications themselves. Both observations imply that, unlike at the conceptual level, at the linguistic level it is impossible to specify one coherent system for the behavior of qualificational forms, in function of conceptual layering: there must be separate accounts for each structure type. Moreover, the effect of qualifications is not exhausted by referring to the expression types mentioned (plus, for epistemic modality, the types mentioned in Chapter 5): as we have seen, even the syntax per se, as well as intonation, can sometimes figure as an expressive device, even if probably in dependence on specific expression types.

Of course, we have observed many interactions between expression types, so a model needs to state coordinating principles between them. Quite in general, for each utterance the different expression types must be attuned such that the set of conceptual qualifications which needs expression — as included in the situational network — receives appropriate coding by means of a balanced selection of forms from the different linguistic categories. And this is probably not a trivial operation, at least in Dutch, German or English.

For they show strong limits on the number of adverbials, grammatical markers (auxiliaries) or predicational expressions one can pack into one utterance. Recall that this is precisely why, in the epistemic range, these languages have two alternative expression types which are otherwise functionally equivalent, viz. adverbs and modals. And there are also restrictions on how forms from different categories can be combined. Not all combinations are possible, as shown by the (non-)combinability of epistemic modality and (inter)subjectivity in different expression types. Some combinations create specific meanings, witness the case of tense marking on certain epistemic forms. And combinations involving a complementing expression require consideration of the sentence domain — main or complement clause — in which the other form can occur, as the interaction with (inter)subjectivity or time markers has shown. Even expressing one conceptual qualification may need the coordinated use of more linguistic categories: e.g., split expression of epistemic scalarity and polarity involving an adverb, an adjective or a verb requires a combination of that form with (usually) a grammatical form, assuming that the negative and, in Dutch and German, positive polar particles are grammatical markers. In English, positive polar marking combined with any expression type often even requires combination with intonational devices.

However, many of these issues again belong in the procedures coding the conceptual qualifications in linguistic structure (in terms of FPG: in mapping the situational network and/or the singular state of affairs onto a predication), rather than in linguistic structure or processing per se. Surely, some elements **are** strictly syntactic, such as how many forms from one expression type can be combined in one utterance, how forms from different categories formally relate (the relative syntactic situation of forms), and where they can be positioned in surface structure. These are perfectly comparable to, e.g., the specification of the number and formal type of arguments a predicate can take and how they can be ordered in surface structure — the classical domains of syntax (including lexical structure). Thus, RRG is fully justified in aiming to deal with the linear ordering of affixes on the predicate in syntactic structure. But the point is: this is strictly an ordering issue, not a layering issue, even if the former is motivated by the latter.

Already much more peripheral to linguistic structure is an issue such as the epistemic weakening use of a tense marker in some combinations. This is not a fact about the syntax of the tense marker per se: the syntactic

features of its normal and epistemic uses are identical. Rather, this is a fact about the coordinated selection of forms with specific meanings from different linguistic categories in predicating, even if the combination is quite structuralized in this case. There is, in fact, a strong lexical dimension to restricting the phenomenon to some combinations while excluding others. Critical here is the concept introduced in Section 6.4 of grammatical markers as lexical entries just like normal lexemes, which thus include a meaning specification through a pointer to the relevant conceptual categories, as well as a specification of their syntactic combinatorial possibilities. The weakening use of the past tense marker, then, may, besides its normal entry with a pointer to the past meaning, require a separate, very specific lexical frame specifying the combinations (e.g., with epistemic uses of some mental state predicates) in which it can receive this weakening meaning.[25]

In most other cases, however, which forms from one expression type or across expression types can be combined in one utterance is a purely semantic issue. This is perfectly comparable to the selection restrictions in combining predicates and arguments, which also clearly belong in conceptual structure and not in syntax. For example, it is probably a universal principle that one utterance cannot feature different expressions involving conflicting values of the same conceptual qualification. Only semantically compatible, harmonious forms are allowed. But this has little or nothing to do with syntactic limitations, but is a purely conceptual condition. Its linguistic effect is due to the coordinated selection of individual forms from the different expression types when mapping conceptual onto linguistic representation. Similarly, the fact that *I say that I think that they have run out of fuel* is fine but *I think that I say that* … normally makes no sense has nothing to do with the syntax of these predicates, but is purely semantic. The same applies, e.g., for the impossibility of **hopefully they probably ran out of fuel*: the sentence is fine with each of the adverbs separately, in the same position, or even with other adverbs in these two positions, as in *probably they soon ran out of fuel*, so this cannot be a syntactic issue. Such combinations need not be prohibited by the grammar. Rather, assuming that the language

25. For this kind of phenomenon, Construction Grammar as developed by Fillmore and colleagues (Fillmore 1988; Fillmore et al. 1988) allows a very elegant treatment, which might offer inspiration for modeling the lexicon in the kind of framework proposed here.

production system is intelligent, i.e. directed by the conceptual system, as is assumed in FPG, they simply do not get coded in linguistic form, since they are not reasonably or logically conceivable in conceptual structure.

In summary, it looks like the layering of qualificational categories is an excellent example of an 'emergent' domain of grammar, more or less in the sense of Hopper (1987, 1998).[26] To avoid any misunderstandings, let me stress once again that this does not mean that layering does not affect syntax. On the contrary. But the 'layered' behavior of linguistic forms is not to be explained by means of layered representation in syntax, but as an effect of layering in conceptual structure in combination with the procedures for mapping conceptual categories onto linguistic forms. For the rest, the linguistic forms are subject to the same types of grammatical specifications as linguistic forms pertaining to the expression of conceptual states of affairs, even if the behavior of the former is qualitatively different from that of the latter, precisely because of their link to conceptually completely different types of domains. Moreover, it looks like any domain of grammar can participate in the expression of qualificational dimensions: practically any linguistic form type or 'part of speech', as well as syntax and intonation. To put it squarely, in linguistic structure layering is everywhere and nowhere.

6.5.3 *The position of information structure*

What about the position of the additional functional factors which we have observed to determine the linguistic coding of the conceptual qualification in the epistemic paradigm? The interaction with evidentiality, and specifically with (inter)subjectivity, obviously originates in conceptual structure proper: it involves the joint expression of two related qualifications in the layered conceptual system. And also the performativity issue involves a basic

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26. Note that I am talking about an 'emergent domain of grammar', applying Hopper's concept of 'emergence' to that specific domain only. I do not wish to imply that I subscribe to Hopper's general concept of Emergent Grammar. I do agree that "structure, or regularity, comes out of discourse and is shaped by discourse in an ongoing process" (Hopper 1998: 156). But, surely, there is more than only discourse to shape language, witness the discussion in Section 6.1. In fact, discourse itself is the product of an amalgam of dimensions, and is arguably emergent. For that reason alone, I disagree with the claim that grammar as a whole is "simply the name for certain categories of observed repetitions in discourse", or "is, in other words, epiphenomenal" (ibid.: 156). Going into this is beyond the present concerns though.

distinction in the layered system at the conceptual level. I return to these in Section 6.6. The factors of information structure and discourse strategy, however, are probably to be situated in the processing system mediating between the conceptual and the linguistic levels. Let me first discuss information structure, and turn to discourse strategy in 6.5.4 below.

There is a trend in functional grammars to situate the operation of information-structural notions in linguistic structure proper. FG introduces the pragmatic functions topic and focus as the last step in preparing the predication for input to the expression component, even after the assignment of the syntactic functions subject and object, and after the specification of all operators and satellites (cf. Dik 1997a: 60). RRG is more ambivalent (see Van Valin 1993: 22ff; Van Valin and LaPolla 1997: 202ff). It does acknowledge that information structure influences several dimensions of the mapping of semantic onto syntactic representation. Still, it formally introduces the dimension in syntactic structure, as a third projection, the focus projection, next to the constituent and operator projections.

But information-structural notions clearly need not be introduced in syntax, but much earlier in a cognitive model of language use. This is another instance of overcapacity of linguistic grammars due to their narrow scope on linguistic structure only. Not only in RRG, but in functional linguistics in general, including FG, there is agreement that information structure is a pervasive element affecting nearly every aspect of linguistic structure, from the use of specific construction types (clefts, e.g.) via word ordering processes (preposing constituents, dative shift, passivization, etc.) to phonetic realization (see Nuyts 1990a, 1990c, 1992b). That observation alone strongly suggests that this dimension is very basic in language production, and prior to any of these linguistic processes. That is in fact what language psychologists think, too: to the extent that they pay attention to information structure at all, they usually consider this a pre-lexical matter (see, e.g., Levelt 1989).

Our analysis of the epistemic paradigm offers a more stringent argument to this effect, fully in line with the argumentation in Section 6.4. If focality vs. non-focality of the epistemic qualification determines a speaker’s choice between epistemic expression types, then we cannot but assume that focality is determined before the predicational level in language production. That is, if informational status determines lexical choice and the corresponding selection of a construction type, then it must have been determined before

the level of verbalization. In the same vein, the observation in Section 6.1 that information structure affects diachronic change and thereby systematically disregards the borders between expression types unavoidably implies that this factor is prior to linguistic expression.

On the other hand, information-structural differences can hardly be considered to be inherent in conceptual representation as contained in the universe of interpretation (cf. also the discussion of Dik's view in Section 6.4). This, too, follows from the argument in Section 6.4. For, although epistemic expression types differ in their information-structural possibilities, they nevertheless all do express the same basic meaning category. The difference is only a matter of the perspective from which the information is presented. So the first premise of the argument for non-verbal conceptualization in Section 6.4 — if the same core meaning, then the same core level of representation — is fully applicable here as well.

This point can also be made in more general terms, which at once give a more specific sense to the notion of abstractness in the discussion of the nature of conceptual representation in Section 6.4. The ability to retain information from individual encounters with reality in local contexts and store it long-term in conceptual structure is essentially a means to make humans better armed to cope with and less vulnerable for the properties of future local contexts. Yet, obviously, to make information usable across contexts, it must generalize over idiosyncrasies and be devoid of accidental features due to individual contexts. In other words, the information must be decontextualized.[27] This is obviously not specific to language: as Marr (1982; and see also Jackendoff 1987: 170) has argued, also in vision, developing a conceptual image depends on detaching from the accidental perspective of the viewer at one point to form a global concept of the object.

27. This functional argument for decontextualized conceptual representation can be complemented with an argument on the basis of parsimony, and specifically of efficiency in knowledge storage. One chunk of knowledge may pertain to many different discourse situations, hence it would be quite inefficient if it were stored in a way specific for each context in which one has encountered it. For this would mean a potentially endless duplication in memory of essentially the same information. And it would moreover require a heavy conceptual processing load to keep track of how the different instantiations of the chunk of information relate. Moreover, as argued in Section 6.4 in connection with Dik's 'functional logic', to do the latter one probably needs a decontextualized concept of the chunk of knowledge anyway.

I.e., it requires going from viewer-centered to object-centered or perspective-free representation. Language, then, can be considered a means to communicate even generalized information, yet again in ways adapted to the occasional properties of local discourse contexts. That is, language is basically a device for (re)contextualizing conceptual knowledge for the purpose of communication.[28] Now, information structuring is, per definition, a critical element in adapting information to the local circumstances, i.e., in contextualizing information. Hence, even on this basis it stands to reason that this dimension cannot be inherent to the discourse-context-free conceptual structures stored in the universe of interpretation.

We must conclude that information structuring is situated in between the levels of conceptual representation in the universe of interpretation and linguistic representation. In terms of FPG, it must apply at the level of the singular state of affairs or in the situational network. In fact, FPG situates it in both (cf. Section 6.2), for the good reason that there is a sentential as well as a discursive dimension to the phenomenon. Topicality vs. focality of information in an utterance concerns the organization of a singular state of affairs. As suggested in Section 1.4, this dimension can be determined by different dimensions of the status of information in the discourse context, which thus concern the organization of the situational network. As suggested in Section 6.2, this probably includes the traditional dimensions of givenness vs. newness of information in view of the relative state of knowledge of the interlocutors (cf. Chafe 1994: 71ff, 161ff, who calls this 'activation cost'), of thematicity of information in view of the thematic or topical organization of the discourse (cf. Givón 1990: 900ff), and of contrastiveness of information relative to other information in the immediate discourse context (see Givón 1990: 699ff; Chafe 1994: 76ff).[29]

28. To the extent that language is just one of the means humans have to acquire and transmit knowledge (next to other communicative devices such as gesture, or direct perception, e.g. through vision), even the choice for language as a means is a 'contextualization' procedure.

29. Chafe (1994: 78) expresses reluctance regarding the usefulness of a notion of 'focus' (and 'topic') beyond notions such as contrastiveness and activation cost. Givón (1990: 699ff), on the other hand, does accept its relevance as a 'superficial cover term' for different deeper dimensions. I will not go into this discussion here, however, and continue to assume the latter position.

Let us briefly return to the role of information structure in epistemic modal expressions. We have already explained, in Section 6.1, that the fact that they are so rarely focal is perfectly understandable in view of the conceptual position of epistemic modality as a metarepresentational notion. Note that this further reinforces the assumption that information structure is post-conceptual, since it is effected by conceptual structure, but at the same time very profound, since it is directly related to conceptual structure. Now the remaining question is: what does this fact, as well as our observation that the few focal uses of epistemic expressions are always due to contrastivity, mean in terms of our processing model?

Apparently, dimensions such as thematicity and givenness vs. newness only pertain to the representation of a state of affairs, and possibly to some of its 'situating' qualifications (see below), but not to high-level operations over it, such as the performance of an epistemic evaluation. It does, in fact, stand to reason that epistemic evaluations do not participate in the thematic organization of the discourse (see also Lötscher 1985). Likewise, one can easily see why they should not be susceptible to the labels given vs. new. In a way they are always new, to both speaker and listener, actually, for they are in principle produced hic et nunc (see Section 6.6). But this newness is somehow quite different from how information about a state of affairs can be given vs. new in view of the relative state of knowledge of the interlocutors. In the empirical chapters I have not discussed the role of the notion of topic in epistemic expression types, because it does not discriminate between them in any way. But it does not require much reflection to see that, in line with these reflections, non-focal epistemic expressions can hardly be called topical elements in an utterance either.

That epistemic evaluations do acquire focality due to contrastivity underlines the special position of this dimension. Unlike thematicity and given vs. new, contrastivity arises out of a conflict between chunks of information, or out of the need to oppose related chunks of information, in the very local discourse setting. This can happen to any kind of information, irrespective of its conceptual status. In epistemic evaluations this probably typically arises because, in the context of talk about a state of affairs, an interlocutor raises an opinion about the epistemic status of that state of affairs which does not conform to the speaker's own assessment. This draws the latter's focus of attention (see Section 6.6) to that assessment per se, thus triggering a contrastively focal expression about it.

There are probably yet other qualificational categories which have this special informational status: since it directly correlates with the position in the conceptual layered system, qualifications in a position similar to epistemic modality may be expected to have the same property. Whether this applies to all qualifications in the layered system is doubtful though. If in our experimental investigation we are justified in interpreting the ambiguous cases of the modal *kunnen* 'can/may' as dynamic modal, then this qualification does frequently occur in focus (and see Section 4.4). As argued in Section 5.5, they may even be used as an escape route to avoid focusing an epistemic form. Of course, these cases essentially still involve a contrastive context. The discussion of the ordering of temporal and epistemic adverbs in 6.5.1c above suggests that also temporal adverbs may acquire focality, and possibly even because of newness. This issue requires systematic empirical investigation. But maybe the special informational status, at least in the radical form found in epistemic modality, only applies to the qualifications highest in the layered system.

Thus, to forecast semantic dimensions to be introduced in Section 6.6, one might postulate a cut-off point for this property in between the qualifications which do concern types of speaker commitment to a state of affairs, viz. epistemic and deontic modality and evidentiality, and those which do not, viz. all qualifications from time downward. It would, of course, not be surprising to find that even below that point there are gradations in the accessibility to information structuring processes, correlated with the relative height of the qualification in the layered system. So the adequacy of Langacker's (1974) claim that languages focus on objective content, or Chafe's (1994) suggestion that 'regulatory units' in general stand apart in terms of information structure, is probably dependent on how one defines the notions of 'objective content' and 'regulatory unit'. But if in our terms they are identified with 'representation of the state of affairs' and 'qualification of the state of affairs', respectively, they may not be entirely correct.

Another question which the present investigation leaves open is to what extent the special informational status is also applicable to descriptive qualifications, epistemic and other. On the one hand, since descriptive qualifications are in a way part of the state of affairs talked about, one might suspect that they are not subject to the restrictions noted for performative qualifications. On the other hand, our analysis has not revealed a single case of a descriptive epistemic expression with other than contrastive focus.

More on this in the discussion of performativity and descriptivity and layering in Section 6.6.

6.5.4 *The status of strategic uses*

The factor of discourse strategy hardly figures in the discussions in this chapter. The reason is that, as indicated in Section 6.1, it stands quite apart from the other factors in having no structural dimension. It does not have any expressive devices specifically associated with it. It is rather a matter of employing the semantics of forms for interactive purposes. Like information structure, this is a dimension which operates in between conceptual and linguistic structure (the argument is parallel to that for the intermediary position of information structure). But unlike information structure, once applied it has no further consequences for the linguistic processing of the form. I will therefore not dwell long on this factor. Let me just briefly sketch how strategic uses of epistemic expressions may come about. As suggested in the empirical chapters, the strategic uses of the modals and the mental state predicates seem to involve different issues.

– Like the non-strategic use, the mitigating use of the mental state predicates may be conceived of as involving the marking of a performative subjective and epistemic qualification over a state of affairs in the situational network. The difference with the non-strategic use resides in how this marking comes about: it results from a different type of information source. In the strategic case it does not directly, or not only, or even not at all result from a reasoning process over conceptual knowledge in the encyclopedia assessing the probability of the state of affairs. Rather, it results from the speaker's assessment, contained in the situational model (see Section 6.2), of the position of the state of affairs in the hearer's mind, in function of the current interaction: e.g., what is the hearer's attitude towards the state of affairs and towards the speaker, what is the social status of the interaction, etc. The real epistemic status of the state of affairs in conceptual knowledge may thereby not matter at all: recall that in strategic uses the speaker often understates his/her position and qualifies a state of affairs in terms of subjective probability even if (s)he is actually fully certain about it, i.e. has it epistemically qualified in the encyclopedia as being certain. Of course, assuming that

in communication a speaker always takes both types of information into account, it is obvious why — as observed in Section 3.5 — the borderline between strategic and non-strategic uses is not sharp at all.

– Also the argumentative use of the modal auxiliaries (and possibly of the weak modal adverbs — see Section 4.5) can be taken to result from the speaker's assumptions in his/her situational model about the hearer's knowledge and views, specifically with regards to some relevant hypothetical state of affairs. But here it is also essential that the speaker him/herself holds a different view regarding that state of affairs. So here the speaker's epistemic assessment of alternative hypotheses in his/her own encyclopedia does matter. Still, the epistemic modal is not used to express the speaker's own assessment of one of the hypotheses, but rather to admit the hearer's view as against his/her own hypotheses, often solely for the sake of saving the hearer's face. For the speaker may actually consider the hearer's view completely misguided. The marking for this is probably introduced while structuring the information in the situational network, whereby the two alternative hypothetical states of affairs, one favored by the hearer and the other by the speaker, are opposed. The marking for epistemic possibility of the former serves simultaneously to save the hearer's face and to mark the logical relation between the two states of affairs.

6.5.5 *The nature of processing epistemic expressions*

The discussion in the above Sections clearly underscores the importance not only of a depth perspective but also of a dynamic perspective for modeling the cognitive systems for language use (cf. Section 1.2). Explaining what appears at the linguistic surface systematically requires reference to the processual relations between the structural linguistic and deeper levels of information representation. In line with the conclusion of Section 6.1, the processing involved must be fairly complex. It draws on different types of conceptual information: not only about the states of affairs one is talking about and one's qualifications of them, but also about the hearer and about the development of the current discourse. And it requires coordination of decisions in different phases and regarding different aspects of the process of utterance construction, up to the level of intonation. It is hard to see, then, how one can avoid a strongly interactive concept of language processing,

even at the syntactic and prosodic level, i.e. in the predicating and expressing components (pace views to the contrary in language psychology — see Sections 1.2 and 6.6).

Our investigation of the epistemic paradigm nicely illustrates the dynamic nature of the cognitive systems in language use in yet another way. Returning to the conclusion of Section 6.5.2 above, consider what the quite peculiar structural behavior of epistemic expressions, resulting from their specific conceptual and information-structural status (cf. Section 6.1), means in terms of linguistic organization and processing. Here is a summary of the relevant facts. Epistemic expressions generally show a strong tendency to appear more or less detached from the representation of the state of affairs in the utterance. This comes in degrees and types. The adverbs and parenthetical mental state predicates, both exclusively performative forms, are characterized by a free position within the utterance. The complementing mental state predicates, adjectives and modals appear in a superordinate clause. But the mental state predicates even in this pattern show a clear trend towards complete syntactic detachment from, hence a free position relative to the clause representing the state of affairs, resulting in a scale from fully complementing to fully parenthetical uses. This trend appears not to apply to descriptive uses, however. The adjectives, even performative ones, do not show this tendency at all, and that is presumably due to the fact that they are predominantly used focally. If so, focal performative uses of the complementing mental state predicates may be expected not to show signs of syntactic detachment either, but the number of cases in our data is too small to verify this. The complementing modals do not show signs of detachment between main and complement clause either, but that may be because they are still too unstable. Only the modal auxiliaries in their basic use are strongly tied into the expression of the state of affairs, unavoidably so because of their status as grammatical markers. But even they show signs of detachment, e.g. in not allowing tenses other than the present and in having no ties with the subject of the clause.

All of this suggests that non-focal performative epistemic evaluations and their expressions tend to be processed quite independently of the representation of the state of affairs, with minimal to no interference between the operations handling them. The result obviously depends on the structural properties of the selected expression type. Thus:

- In the completely free forms there is only interference to the extent that the epistemic expression selected from the lexicon must be inserted in the word order pattern in the course of the expressing processes (cf. Section 6.2). As a consequence, the position occupied by the epistemic form cannot be taken by another element. But this effect is usually minimal. It normally concerns optional positions, with no effect at all on the positioning of the obligatory constituents in the clause, so there is only interference with the placement of other adverbials. Only clause-initial positioning of the adverb in Dutch and German may appear to be somewhat more consequential. But if the explanation in Section 2.4h for why an adverbial occurs in that position is correct, then even in this case it does not cause the different ordering of the obligatory constituents. Rather, it serves as the problem solver. The cause is the striving not to have any obligatory constituents in initial position. This triggers a search for other elements to fill that position, as filling it is obligatory. A completely detached linguistic form such as an epistemic adverb obviously offers an excellent way out. Of course, in English this is not an issue at all.
- In the complementing forms in Dutch and German there is interference with the expression of the state of affairs to the extent that, in principle, they cause the word ordering processes for the latter to form an embedded clause structure. But, again, this does not apply to English since it does not have special word order for embedded clauses. And even in Dutch and especially in German, for the mental state predicates it fully applies only in some cases: it does not apply in the complementizerless cases, and only partly in the semiparenthetical cases (cf. Section 3.4f). It is not obvious what triggers the choice of a more or less integrated variant, but maybe the degree of formality of the discourse, and the corresponding degree of attention for normative grammatical correctness, is important.
- The processing of the clause-internal modals is least independent: they take a firmly fixed position in the organization of the clause, and they moreover trigger morphological processes such as the assignment of the infinitive form to the main verb.

Even in terms of intonation assignment processes, all these forms have a very autonomous status. As observed, they appear to stand apart from the

normal intonation pattern determined by information structure, which applies to the expression of the state of affairs. Instead, they trigger a special type of intonation, with separate formal characteristics, which offers an additional means to express the conceptual strength of the epistemic qualification. Also, the autonomous status of forms has no doubt facilitated the development of the option to use past tense as an epistemic modifier rather than a marker of time in combination with some of the predicative epistemic expressions.

The situation may be slightly different when the epistemic qualification does acquire focality and/or when it is used descriptively. These cases exclusively result in complementing forms (adjectives and mental state predicates), so the epistemic qualification and the state of affairs do remain relatively separated in processing, since they end up in two clauses. Yet, as observed, the syntactic tie between these clauses appears to be fully maintained, and the special qualificational intonation is probably not available. For in focal cases the epistemic form necessarily draws focal stress, and in non-focal descriptive cases it does not draw special intonation at all. So one may assume that from the level of lexical selection onwards the complex clause is treated more or less as a full-fledged unit.

All of this suggests that the production process of an utterance need not be as tight and uniform as most linguistic grammars would have it. Usually, they picture the clause, even a complex one, as a coherent gestalt, and its grammatical construction as a tightly integrated process. Consequently it is quite common to treat parentheticals, which obviously defy this structural strictness, as completely separate, extra-clausal and extra-grammatical elements. But, as shown, there is no obvious difference between parentheticals and some other linguistic forms. Keeping this phenomenon out of the realm of grammar, and disregarding its implications for one's conception of syntactic processing, is no doubt a mistake. As Chafe (1994) argues on the basis of completely different observations, it is a systematic property of linguistic structure that parts of an expression can have different degrees of integration, depending on their functional status. Chafe even goes as far as to consider the sentence to be a derivative notion: full-fledged sentences are hardly retrievable in spoken language data, so they must be cognitively non-basic. Instead, in his view the basic unit of speech is an 'intonation unit', and a sentence is a more or less loosely interconnected set of such units. Whether one should go this far in abandoning the sentence as a basic structure in grammar is a question I will leave aside here (see Nuyts 1996a).

In any case, even very basic linguistic elements can have a quite variable status, depending on the circumstances. And this not only concerns their degree of integration, but also their structural position. Let us focus on the mental state predicates. In linguistic frameworks, including FG and RRG, but also in language psychology (see Bock and Levelt 1994: 966ff), the predicate is generally considered to be the core which ties together an utterance, or from which the construction of an utterance starts. That is, the predicate is the 'head' of the utterance. In most cases this is no doubt appropriate. For the mental state predicates in particular, it is certainly appropriate for the non-qualificational uses, and maybe even for the focal and descriptive qualificational uses. But it is not adequate for the non-focal performative qualificational uses: our observations clearly indicate that here the mental state verb is not the main predicate of the utterance. This corresponds to Anderson's (1986) observations regarding the evidential reading (as opposed to the literal perception reading) of predicates such as *hear* or *see*, which behave quite like the mental state predicates. In processing terms, these predicates are clearly not the primary or dominant element in utterance planning and construction, contrary to 'classical' predicates.

Thus, one can conceive of the processing difference between the non-qualificational and the qualificational reading of the mental state predicate as follows.

– The non-qualificational use of the predicate is the result of the speaker's intention to describe a mental process, because this is a relevant state of affairs in the communication. So the predicate is a primary selection from the lexicon and a dominant item in the construction of the utterance. Structurally, it ends up as the head of the clause, serving as the central integrating element.
– In the non-focal performative qualificational use of the predicate, however, the speaker still primarily intends to express information about a state of affairs, and his/her epistemic evaluation of it constitutes additional information. For example, when talking about 'them running out of fuel', the predicate expressing the state of affairs proper, i.e. *run (out of fuel)*, is the primary element selected from the lexicon, and the selection of the mental state predicate is secondary. In further grammatical processing, the former predicate remains the core element for utterance construction. As argued, the qualificational predicate is only

integrated to some extent: minimally as a parenthetical, maximally in a preposed clause linked with the major clause by the complementizer *that*. But even in the latter case it is probably not appropriate to characterize it as the head of the clause.

– On the other hand, when it acquires focal status, and maybe also when it is used descriptively, the qualificational predicate possibly does constitute the head of the construction.

One may wonder what these observations imply for the lexical representation of the mental state predicates. In Section 6.4.1 I have adopted an assumption which would probably be made in most standard grammatical analyses, viz. that the lexical frame of a qualificational mental state predicate specifies that it takes a complement clause. The parenthetical use may then be considered the result of a lexical operation of valency reduction. But in view of the above observations, the question is whether one should not rather assume that this lexical frame, at least for the best established qualificational predicates, only specifies the subject position. The complementing structure might then be syntactically introduced whenever there is need to specify the relation with the clause expressing the qualified state of affairs. (This alternative obviously does not change the argument developed in Section 6.4.) This is clearly a subject for further analysis.

Whatever one's view on this, the foregoing clearly shows that predicates are not always predicates in the same way. And it implies that a syntactic phenomenon such as complementation is not always functionally the same thing: in the non-focal performative uses of the mental state predicates, it is clearly not a subordinating device, but rather a simple linking device. But such observations should not really surprise us. For, after all, as our cognitive-pragmatic perspective emphasizes, linguistic structure is no more than a means of coding different kinds of much more basic conceptual and interactional factors. And function uses form in a more flexible way than is commonly assumed. Along with the earlier observation regarding the need to refer to conceptual representation in order to handle linguistic representation and processing, then, all of this strongly suggests that, at least up to the level of syntax, the advocates of an interactive and flexible concept of language processing may be closer to the truth than those holding the view of linguistic

processes as being ‘encapsulated’ and ‘fixed’ — even if the latter is undoubtedly predominant in current language psychology at least since Fodor (1983).[30]

6.5.6 *Cognition vs. typology?*

Let me conclude the discussion of layering and epistemic modality in linguistic structure and processing with a few thoughts about universality in this domain. One more fact emerging from our investigation, which is clearly highlighted especially in cases (b) and (c) in Section 6.5.1 above, is that even three such closely related languages as Dutch, German and English show considerable variation in how they deal with forms at the linguistic level. And this is still nothing as compared to the glaring differences between these and, for example, languages which rely heavily on grammatical affixation for expressing qualifications. But differences not only concern the purely structural properties of forms, but even such fundamental issues as exactly which qualifications can be expressed at all: not all languages have expressions for all dimensions of all major qualificational categories. A fully developed cognitive model of the effects of layering at the linguistic level, then, is bound to be strongly language-dependent. But if so, what about the typological concerns of models such as FG and RRG, and their quest for universals? After all, especially RRG explicitly claims to be a

30. Language psychology obviously does admit certain types of flexibility, witness, e.g., the concept of ‘incremental’ processing which is now widely accepted in research on language production (cf. Kempen and Hoenkamp 1987; Levelt 1989). Yet, paradoxically, even granting its plausibility in principle, there appear limits to how far this particular kind of flexibility can be taken. Thus, how the above notions of integration vs. non-integration of expression forms and primary vs. secondary lexical selection of predicates can be translated in terms of such a concept is not obvious. But in any case, despite the fact that there are probably more (structurally) free elements in a clause than traditional linguistics would grant, even in spoken language most components of a clause — including the first produced ones — have a certain degree of grammatical cohesion. That is, they show different syntactic interdependency relations with some or all other components. An incremental model somehow has to deal with the difference between a predicate which is the head of its clause and one which is not, and between a constituent which is grammatically integrated in the clause and one which is not (irrespective of when in the production process it is actually uttered). It is not obvious how this can be done without assuming a full utterance plan (no matter how rough it may be). And since early as well as late constituents must fit into it, it would seem needed at an early stage in the production process.

formulation of a universal grammar. Van Valin and LaPolla (1997: 41f) admit that except for illocutionary force and negation, no operator need be universal, since for each one there are languages which lack it. But as the above cases alone show, the variability extends beyond that level. So the question is: is there not a conflict between typological and cognitive concerns here?

There is no reason to believe there is one. To the extent that RRG, e.g., postulates a fixed and presumably universal hierarchy of qualificational categories in the operator projection at a strictly syntactic level, it is overgeneralizing, at that specific level of description. It is very plausible to formulate such a hierarchy as a universal principle, but only at the level of conceptual semantics (see Section 6.6), not in surface syntax. At the structural linguistic level, the variability between languages clearly extends beyond the mere filling in of details in a generally applicable fixed scheme. But speakers obviously only know the system of expression forms of their own language. They can also be said to ‘know’ the universal principles of the way conceptual layering affects linguistic structure, in the sense that these are necessarily implemented in the system specific to the language they know. So, no doubt, finding these universal principles is essential for developing a cognitively plausible model of the linguistic level. But at this level these principles are probably much more elementary and abstract than is assumed in a proposal such as RRG. Consider, for example, the borrower principle introduced in Section 6.5.1. It remains to be seen whether this can count as a universal, of course. But if so, then this principle can only be stated in very general terms, and in any worked out grammar model it will probably have to be implemented in ways which are no longer universal. In other words, the notion of a universal grammar is something to be very careful with.

Even the quest for universals, then, requires an explicit concern with the status of different levels of cognitive functioning and the processing relations between them. Typological and cognitive analyses of language are not two unrelated strands: they are both involved in the same ambitious enterprise of understanding language as a universal yet also highly variable and flexible type of behavior emanating from the human mind. No doubt, cognitive research must urgently start taking language typology seriously, after many decades of nearly complete neglect. But, in the same vein, typological research urgently needs to take serious the cognitive dimension of language. If not, both are bound to loose sight of the very nature of the subject matter and the limits this imposes on theorizing.

6.6 Principles of layering in conceptualization

Let us return to the conceptual level as contained in the encyclopedia in FPG. As argued, this is where the matter of layering of qualifications in view of their semantic scope is really at issue. The question is how we should conceive of this system and the position of epistemic modality in it.

Since the FG and RRG layered models may potentially incorporate semantic dimensions relevant at the conceptual level, it is useful to start again from a comparison between them. As their presentation in Section 6.3 shows, each postulates a quite different type of hierarchization of qualifications, hence a different kind of relation between epistemic modality and neighboring qualificational categories. In RRG the semantic hierarchy is fully gradual: each qualification constitutes a separate level, all qualifications are positioned hierarchically relative to their immediate neighbors. FG, on the other hand, postulates a stacked system: it assumes four layers, each of which harbors several qualificational categories, but qualifications at one level are not ordered relative to each other.[31] Which concept is more appropriate, and why? The answer is complex, so let's go through it step by step. We will often have to look beyond our own investigation of epistemic modality, so the following is again fully subject to the warning launched at the beginning of Section 6.5: many claims will need corroboration by means of further empirical research.

6.6.1 *The gradualness of qualificational scope relations*

Let us first take a microlevel perspective on the issue. A preliminary review of the semantic combinability of neighboring qualifications in one utterance suggests that a gradual system of the type proposed in RRG grasps the conceptual relations between them better than a stacked system as in FG.

31. RRG does assume a grouping of qualifications in syntax, of course, in that each qualification is related to one of the three major syntactic levels of structure postulated in RRG, viz. the nucleus, the core, and the clause. Hence each of those levels has several qualifications affecting it. However, it is far from obvious that such a linking is needed in syntactic structure at all: the linking is meant to handle the extension of scope of a qualification relative to (parts of) the information about the state of affairs, but that issue is no doubt conceptual again. See below.

The situation is most obvious for the interactions between some of the major qualificational categories in the middle and lower range of the system.

a. *Epistemic or deontic modality and time*
As argued in Section 6.5.1, performative epistemic modality has semantic scope over time. In a similar fashion, performative deontic modality has scope over time, and not vice versa.[32] For example, (278) means that ‘it is advisable (now) that John see a doctor soon’, but cannot mean ‘it will soon be the case that it is advisable that John see a doctor’. Likewise, in (279a) the meaning is clearly that ‘I (the speaker) issue an obligation, here and now, for you to finish that paper tomorrow’, but not ‘tomorrow I will issue an obligation for you to finish that paper’. So (279b) is semantically awkward. The utterance would sound better with the future modal *will* in the main clause, assuming one can find a context in which it would make sense to say this. But then the deontic expression is used descriptively, not performatively.

(278) (Since he has a high fever,) John should see a doctor soon

(279) a. I insist that you finish that paper tomorrow
b. *Tomorrow I insist that you finish that paper

b. *Time and quantificational aspect*
Time has scope over quantificational aspect, i.e., categories such as iterative, habitual, semelfactive, etc., witness (280). Obviously, (280a) can only mean that last week there were repeated phone calls by John, but not that there is a repetition of John calling last week. Hence (280b) is semantically fine but (280c) is not.

(280) a. Last week John repeatedly called my sister
b. It was the case last week that John repeatedly called my sister
c. *It is repeatedly the case that John called my sister last week

Also recall (cf. Section 4.1e) that the dynamic reading of the modals is affected by, hence is within the semantic scope of, tense marking, which on a dynamic modal unavoidably expresses time. This is true not only for the meanings of ability or inherent potential, which can be considered types of

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32. I withdraw from my claim in Nuyts (1992a: 92) that the relative scope of time and deontic modality may vary. This was based on a mistaken interpretation of data.

qualificational aspect, but also for the meaning of repeated occurrence, which is a case of quantificational aspect.

c. *Quantificational and qualificational aspect*
Quantificational aspect has scope over qualificational aspect: (281a) is equivalent to (281b), but not to (281c). The latter makes no sense at all.

(281) a. (During the celebration) he started to cry a few times
b. It was a few times the case that he started to cry
c. *It started to be the case that he cried a few times

The relations at the higher end of the scale, specifically those between epistemic modality, deontic modality and evidentiality, are more complex. Here are some tentative observations about the combinability of these three categories.[33]

d. *Epistemic and deontic modality*
At least in English, Dutch or German, combinations of epistemic and deontic modality are not easy to achieve in one utterance.

At first sight, there are no combinations of these two meanings in one lexical form, comparable to the combination of epistemic and evidential meanings presumably occurring in certain lexical items (see below). Unless forms such as *hopefully*, *I hope*, and *I fear* would qualify as such. Also recall that there is completely no interaction between the epistemic and deontic meanings of the German and Dutch modal analyzed in Chapter 4.

To the extent that independent epistemic and deontic forms can be combined, it seems two kinds of things can happen. First, there are a few combinations of the kind in (282).

33. Especially in view of the highly tentative nature of intuitions in these domains, checking the representativity of the following requires an in-depth empirical investigation both of the semantic categories of evidentiality and deontic modality (parallel to the present investigation of epistemic modality) and of the co-occurrences of expressions of these, mutually and with epistemic expressions. Such investigations would be highly desirable anyway: evidentiality (at least in West Germanic) and deontic modality (quite in general) have hardly received systematic attention (much less than epistemic modality), hence our current understanding of them is very poor. And a systematic empirical investigation of the co-occurrence possibilities and patterns of (types of expressions of) different qualificational categories is to my knowledge completely outstanding.

(282) a. I think you should go to that meeting
b. Probably it would be best if you go to that meeting
c. Maybe you better go to that meeting

Here the epistemic forms are clearly performative, but it seems the deontic forms are performative too: in each, what the speaker actually does is issue — with at least some degree of commitment on his/her part — advice (of different strengths) to the hearer. What happens is that the epistemic form, exerting its normal function of expressing the degree of speaker commitment to the truth of the information, modifies the degree of speaker commitment to the deontic evaluation. But it thereby leaves some degree of commitment to the latter intact. That is, the epistemic form actually serves as a kind of mitigator of the deontic qualification. In fact, in essence the deontic stance is the main one in these utterances. Such cases are thus somewhat reminiscent of the speech act uses of epistemic adverbs and mental state predicates in questions observed in Chapters 2 and 3. The difference is that in questions these forms can hardly be said to express epistemic modality anymore, while in the present cases they do seem to be epistemic.

The majority of combinations is as in (283), however. Here the epistemic evaluations are clearly performative, but the deontic ones rather seem descriptive. The speaker is not expressing or committing him/herself to the view that the hearer is permitted or obliged to go to the meeting, but is rather reporting or speculating on a permission or obligation which someone else may/will impose on him/her. This is thus perfectly comparable to the use of epistemic or deontic expressions under tense marking, of the kind discussed in Section 6.5.1.[34] Other combinations are simply impossible, witness (284).

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34. The question is whether the kind of combination in (283b) is really possible or would ever be used at all. Since the epistemic modals cannot be used descriptively, one might expect the same for the deontic ones. Determining whether this is true is something for a corpus investigation. However, one interesting observation is that Dutch, at least, has developed a syntactic pattern for the deontic modals which allows one to specify the source of the deontic evaluation, hence allows them to be used descriptively: e.g. *Jan mag niet in de tuin van zijn mama* (literally) 'John may not go into the garden from his mother', i.e. 'John's mother forbids him to go into the garden'. German has even developed a modal which, when used deontically, automatically implies that the deontic stance is due to someone else: *Du sollst nach Hause gehen* '(they request that) you must go home'. English does not seem to have similar strategies for the deontic modals. It does have forms such as *John's mom says that he can't go into the garden*, but this involves indirect speech reporting, which, as argued, is a very special context

(283) a. You may be allowed/obliged to go to the meeting
b. Probably you may/must go to the meeting
c. You may have to go to the meeting
d. It is probably desirable/necessary that you go to the meeting
e. It is likely that you have to go to the meeting
f. I think you may go to the meeting

(284) a. *You may better go to that meeting
b. *It is probable that you better go to that meeting

e. *Evidentiality and epistemic modality*
Our empirical investigation has revealed in great detail that in some epistemic expression types performative epistemic modality combines, in a quite fixed way, with markings of (inter)subjectivity, but that other expression types are neutral in this regard, and even do not allow combination with separate markers for subjectivity (see Section 6.5.1).

The situation is quite different for other types of evidentiality, specifically the traditional types coding the nature of the information source, i.e. inferentiality, hearsay, etc. To avoid confusion with the wider notion of evidentiality, which I have used to include (inter)subjectivity, let's coin this narrower category 'source evidentiality'. As observed in the introductory sections to Chapters 2–4, there may be some adverbial, auxiliary and predicational forms which combine an epistemic and a source-evidential element in their lexical meaning. But it remains to be seen whether the epistemic meaning is equal to, or is rather only an implication of, the source-evidential meaning. Combining independent performative epistemic and source-evidential forms in a clause appears nearly impossible, however. There is one exception. As also observed in Section 2.2, epistemic adjectives can combine with the auxiliary-like inferential predicate *seem* in English, *lijken* in Dutch and *(er)scheinen* in German, as in *it seems probable that he went to the party*. This is intuitively a well established and often used pattern, in which the adjective is no doubt performative.

Even in minimal variants of this pattern, however, as in (285a-b), the latter appears no longer true. In the Dutch version of (285a), or in English (285b), to the extent that one can find contexts in which these can be used

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in terms of performativity and descriptivity.

at all, the evidential predicate or adverb is performative, but the epistemic adjective is clearly descriptive: no speaker commitment involved. The English variant in (285a) sounds much better, but it appears subject to the same analysis. Some other combinations of source-evidential and epistemic forms, such as in (285c–e), are fine, too, but again the epistemic form is each time descriptive. In (285c) the hearsay predicate marks an indirect speech report, so the speaker is in principle (cf. Section 2.3) not committed to the epistemic evaluation contained in the latter. In (285d-e) the descriptivity of the epistemic form is obvious.[35]

(285) a. It appears likely that he went to the party
Het schijnt/blijkt waarschijnlijk dat hij naar het feestje gegaan is
b. It is seemingly/apparently probable that he went to the party
c. I hear/have been told he might have gone to the party
d. John seems to think that Mike went to the party after all
e. The generals apparently consider it likely that the enemy will attack soon (but I don't believe so at all)

Many other combinations of source-evidential and epistemic forms are completely impossible, as is shown in (286). The problems with these expressions are clearly not syntactic: the point is that somehow they sound semantically anomalous.

(286) a. *They appear to have probably run out of fuel
b. *Apparently they have perhaps run out of fuel
c. *It turns out that they have certainly run out of fuel
d. *It looks like they are likely to have run out of fuel
e. *They seemingly might have run out of fuel
f. *It appears they will have run out of fuel

35. The first person version of (285d), *I seem to think that Mike will come to the party after all*, may be conceivable in a highly peculiar context, viz. when the speaker realizes (s)he holds some view without having been aware of it. Even in that case, then, the mental state predicate is probably used descriptively, and not performatively: by means of it, the speaker does not express a commitment to an epistemic evaluation of the state of affairs, but, from a (mental) distance, describes an observation about his/her state of mind.

These intuitive observations are largely supported by our experimental data. As mentioned in Section 5.4f, there were quite a few co-occurrences of performative epistemic and evidential forms in them. Yet this nearly exclusively involved two types of combinations, viz. the well established pattern combining *lijken* 'seem' with an epistemic adjective, and combinations of a source-evidential form with the particle *wel*, as in *dat lijkt me wel een heel plausibele verklaring* 'that seems to me a very plausible explanation'. In the latter case, however, one may wonder whether the particle should not be considered a modifier or an adjunct of the source-evidential expression, rather than an epistemic expression. This would be in line with the assumption that this Dutch particle is a dependent aid to a few qualificational categories, rather than an independent expression of one specific qualificational category such as epistemic modality. Among the rare other cases in the data, there are a few in which the epistemic and source-evidential forms are not really structurally related. In (287), e.g. (cf. story number 5 in Appendix 1), the source-evidential is used parenthetically, and given the pause and intonation break between it and the clause with the epistemic forms it may even be considered a structurally independent afterthought.

(287) *die zal de 'trap wel weer naar de 'deur schuiven/ *'lijkt het
'he will probably push the stairs to the door again, it seems'

There are also two instances, both by the same speaker, of the type *dat lijkt mij wel kunnen kloppen* 'that seems to me to can/may be right' (the main verb literally means 'to knock'), combining a source-evidential predicate and a modal. To my own Southern Dutch native intuitions, this pattern sounds awkward, but according to at least some Northern Dutch speakers it is acceptable. But this example then also faces the eternal problem that it is undecidable whether *kunnen* in it is epistemic, or rather dynamic. Note also that this case, as well as (287), again features *lijken* 'seem', the only source-evidential verb which easily combines with the predicative adjectives in Dutch.

f. *Evidentiality and deontic modality*

As mentioned in Section 1.4, deontic expressions, too, appear to be subject to the dimension of (inter)subjectivity, probably in a way similar to epistemic expression types. Thus, intuitively, some expressions suggest a more widely accepted, intersubjective stance: e.g. *it is necessary for you to go to the meeting*, *you are obliged to go to the meeting* or *smoking is prohibited in the*

public rooms in this building. Others involve a strictly personal, subjective evaluation: e.g. *I consider it necessary that you go to the meeting* or *I suggest that you go to the meeting*. Yet others are probably neutral: e.g. *you ought to go to the meeting*.

As for epistemic modality, however, combinations of performative deontic expressions and source-evidential forms are practically non-existent. Comparable to the epistemic *it seems probable (to me) that* pattern, it is possible to combine source-evidential *seem* with deontic adjectives in a performative reading, as in *it seems advisable/desirable/necessary (to me) that you go to the meeting*. Other combinations, as in (288), are usually fine, often unlike comparable combinations of source-evidential and epistemic expressions (cf. (286)). But these all appear to involve deontic evaluations which are due to someone other than the speaker, to which the speaker is not committed him/herself, i.e. descriptive ones.

(288) a. It is seemingly desirable that you go to that meeting
b. Apparently you may go to that meeting
c. It turns out that you must go to that meeting
d. You are obviously obliged to go to that meeting
e. I hear you have to go to that meeting

The reason why these combinations are possible while many of their counterparts with an epistemic expression are not, may reside in the possibility to use forms descriptively. Epistemic adverbs and modals are necessarily performative (except in reported speech contexts), but deontic modals are apparently not so strict in this regard (see (d) above). I am actually not aware of any clear cases of deontic adverbs.

What do the observations in (d)–(f) mean in terms of the scope relations between deontic modality, epistemic modality and evidentiality? At face value, a simple line of reasoning would be to assume that also at the conceptual level these three qualificational categories are mutually exclusive.[36] In terms of layering, this could mean that they do not have scope

36. Taken in isolation, the strong mutual exclusivity of epistemic and evidential expressions might be considered an argument against treating epistemic modality and source evidentiality, or even evidentiality in general, as two separate qualificational categories, despite the arguments for doing so given in Section 1.3. For, after all, it is a quite general fact that different

over each other, but are juxtaposed, parallel lines in the hierarchy. So the system would fork in three just above the level of time marking. Obviously, each of the three categories can have scope over all levels from time downwards. One can easily explain the well established yet very exceptional and idiosyncratic combination of source-evidential *seem* (and its Dutch and German counterparts) with an epistemic or deontic adjective by referring to the functional properties of the adjectives in Chapter 2. One can argue that this is an occasional formation intended to have an alternative for the default intersubjective *it is probable that* form of the adjectival expression. Its point would be to allow for a less intersubjective, or, if combined with *to me*, even clearly subjective expression of the qualification which is nevertheless easily focalizable. Thus, it is probably no accident that in the German version of the pattern, *es scheint mir wahrscheinlich, daß*, subjectivizing *mir* can hardly be omitted. The combinations of performative epistemic and deontic forms in (282) would have to be explained by assuming that conceptually there is only a deontic evaluation. Finally, in this analysis, one would probably have to reject the possibility of real mixed source-evidential and epistemic forms: they would have to be considered to be purely source-evidential, the epistemic effect being a mere by-product.

There are several objections to this analysis, however. First of all, what to do with (inter)subjectivity, which does combine with epistemic and deontic modality, albeit in strictly delimited ways? In those combinations, there can be no doubt that (inter)subjectivity affects the epistemic or deontic qualification, but not vice versa, so conceptually the former must have scope over the latter. Surely, DeLancey (1997) has argued that the category of mirativity should be distinguished from what I call source evidentiality, and, as argued in Section 1.4, (inter)subjectivity is clearly akin to mirativity. But on the other hand, one can hardly deny, and DeLancey also clearly admits, that these categories do remain semantically very closely related in that they all concern the source background of information. So why should source evidentiality be different from (inter)subjectivity or mirativity in its conceptual relation to epistemic and deontic modality?

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expression forms for one qualificational category cannot be combined in one utterance, a few exceptions involving harmonious forms aside. Yet the fact that the same mutual exclusivity exists for source-evidential and deontic, and for deontic and epistemic expressions unmasks this as a false argument.

As a matter of fact, the mutual exclusivity analysis strongly suggests logical incompatibility between the three qualificational categories involved. But it is hard to see why there should be such an incompatibility. Focusing on epistemic modality and source evidentiality, why should it be impossible to infer things from other information with different degrees of certainty about the conclusion? Or, for direct experience, why should it be impossible to have degrees of certainty about what one has witnessed? Surely, one can see an object or event but not be certain about its identity because it is foggy. Hearsay is more complex: it usually brings along a context of speech reporting, which by fiat means that there is no speaker commitment to the reported domain. So epistemic terms occurring in it normally cannot be truly performative. But the borders between hearsay and intersubjectivity markers are not too sharp (cf., e.g., the discussion in Section 2.3 regarding the status of the intersubjective adjectival pattern in terms of performativity). So even in this case, why could one not have acquired information through hearsay with different degrees of commitment to its probability? The same reasoning applies to the other combinations of qualifications: why can one not infer something from evidence with an accompanying judgment that that something is desirable or needed, or consider something more or less likely while also considering it more or less desirable or necessary?

These considerations at once suggest a hierarchical relation between the three qualifications. Clearly, one needs types of evidence before one can epistemically judge a state of affairs, but vice versa is nonsense. And one must have realized the potential existence of a state of affairs, hence its likelihood, before one can evaluate its desirability, but vice versa is again nonsense.

A special case such as (287) above obviously supports these assumptions. It strongly suggest that performative epistemic modality and source evidentiality can combine provided that their expressions stay far enough apart. And intuitively the evidential qualification does affect the epistemic one, rather than vice versa. Similarly with the possible mixed epistemic and source-evidential expression forms. In the present view it remains open whether they are really mixed ones or purely evidential ones implying an epistemic value. But even if the latter is true, it is significant that the implicational relation exists: how could this be if the dimensions were incompatible? Moreover, it is significant that the evidential dimension should imply the epistemic one, and not vice versa. For the rest, the above explanation

for the special *it seems probable that* pattern perfectly fits the present account as well. And for the combinations in (282), we can leave it open whether these should be considered purely deontic, or rather epistemic and deontic but with a special relation between the epistemic and deontic evaluation, since the utterances are overall deontic. The epistemic forms do have an epistemic meaning, though, so we are not dealing with a borrowing use of epistemic forms by the deontic qualification.[37] And it is significant that the epistemic meaning affects the deontic one, and not vice versa: it is impossible to understand these utterances such that the deontic meaning affects the epistemic meaning.

Of course, if this alternative analysis is correct, then we are in need of another explanation for the severe co-occurrence restrictions on performative epistemic and deontic modality and source evidentiality. Maybe it can be found in the special nature of these three categories. What characterizes them as opposed to lower qualifications is that they make explicit the type and degree of speaker commitment to the state of affairs, as measured against knowledge or information fully external to the state of affairs proper. This committing nature is obvious for epistemic and deontic modality, even if it is quite different in the two. It may seem less obvious for evidentiality. For, in a way this merely involves a naming of the nature of the evidence leading to the speaker's information about the state of affairs. This is distinct from epistemic and deontic modality, which directly evaluate the state of affairs. Yet evidentials do bring the naming of sources to bear on the state of affairs, and they thereby do turn into an indication of speaker commitment to the state of affairs, viz. (non-)commitment to it in view of such and such type of evidence. In lower-level qualifications, however, from situation in time downwards, one can no longer talk about evaluations of a state of affairs in terms of degrees or types of speaker commitment. It makes little sense to say that the temporal adverb *yesterday* in *John went to that party yesterday* indicates a kind or degree of commitment of the speaker to 'John's going to the party'. Time marking does specify the range of applicability of the state of affairs, of course, but that is a matter of characterizing the extension of the state of affairs as such, without affecting the speaker's

37. If they were a case of borrowing, they would also go against the trend observed in Section 6.5 for forms to wander up the layering ladder.

commitment to it. It does not require further discussion to see that the same applies to all lower qualificational categories as well.

Thus, it is probably no accident that epistemic and deontic modality and evidentiality do manifest a distinction between performative and descriptive uses, i.e. uses with vs. without speaker commitment to the qualification itself, while lower-level qualifications do not. Examples of the distinction in epistemic expressions have been abundant in Chapters 2–4, illustrations involving deontic modality were given in (d) and (f) above. In the domain of evidentiality, descriptivity is present, e.g., in *in those days it still appeared obvious that there would be no end to economic growth*, or *it looked like they would win the game, but in the end they didn't*, or *John considers it plausible that they have run out of fuel*.[38] There is nothing comparable for a qualification such as time: when formulating a temporal qualification over a state of affairs, a speaker is normally automatically committed to the qualification, and (s)he cannot signal in any direct way that (s)he is not committed to it. To do so, the time marker must be embedded under separate markers of reduced commitment or non-commitment, such as epistemic expressions, or markers of direct or indirect speech reporting, or it must be embedded in descriptive contexts such as questions and conditionals.[39] The same goes for any lower qualification.

Similarly, it is clearly no accident that epistemic and deontic modality and probably even source evidentiality show a special link with (inter)subjectivity, reflected in the fact that expressions of the former offer structural possibilities for the expression of the latter, while lower-level qualificational dimensions do not. Of course, (inter)subjectivity is an autonomous qualification which has fully independent expression forms (see Section 1.4), and these can combine with lower-level qualifications as well. But that is clearly

38. I am assuming that adjectives such as *plausible* or *logical* can be classified as expressing types of evidentiality, viz. as involving gradations of inferentiality. See also Chapter 5.

39. One might object that this fact is obviously due to the absence of predicative time markers. For, as observed in the course of our analyses (and see Section 6.1), direct descriptive uses require a syntax which allows change in time or person, and that is only possible on predicative (verbal or adjectival) forms. But one can also turn this argument around and assume that the reason why time and lower qualifications do not, but higher qualifications do have predicative expressions is the result of a need for those higher qualifications, but not for the lower ones, to have a means to explicitly signal (absence of) speaker commitment to the qualification.

different from the very intimate structural interrelations we have witnessed in our epistemic paradigm, for example. The explanation is obvious: it stands to reason that a concern with one's commitment to a state of affairs is more likely to offer a reason for also being concerned with whether one stands alone or not in one's evaluation or opinion, than a concern with, e.g., the whereabouts of a state of affairs in time or space does.

Now how does all of this explain observations (d)–(f) above? Well, it does not seem farfetched to assume that it is difficult to combine these three qualifications in one clause because normally a speaker is not or cannot be concerned with his/her commitment to a state of affairs in several different ways at the same time. Probably, two such evaluations cross the speaker's mind simultaneously only when they are intimately related or directly support each other. And languages apparently tend to develop special strategies for this kind of situation, in which the expression of the two evaluative dimensions is intimately interconnected, as with (inter)subjectivity in epistemic expressions, or (possibly) with the mixed epistemic and evidential expressions. Obviously, one can more freely commit oneself in different ways consecutively, given a time lapse, as in (287). These restrictions on the simultaneous expression of the three high-level qualifications are reminiscent of Givón's (1984: 258ff) 'one chunk per clause principle' and Chafe's (1994: 108ff) 'one new idea constraint', which state that, in the range of information about states of affairs, speakers will usually only formulate one new idea per clause. Not that our present 'one commitment per clause' principle may be considered a special case of this: as discussed in Section 6.5.3, the notion of old vs. new information is not applicable to these high-level qualificational notions. What is similar, however, is that the present observation, too, reveals a limitation on the processing or reasoning capacities of the central conceptual system.

Surely, there is a limitation on the number of lower-level qualifications one can express in one clause as well: intuitively, it seems quite unlikely that in spontaneous language use one will express more than a few of those at a time. This, too, can no doubt be explained in terms of conceptual processing limitations. Nevertheless, there is a difference with the higher-level qualifications in that there is no obvious tendency towards mutual exclusivity between specific qualifications at those lower levels. And maybe that is because the thought processes required for those lower-level qualifications

are less complex than those required for the higher-level ones, specifically those involving degrees and kinds of speaker commitment (see below).

In sum, the observations in (a)–(f) strongly suggest that it is inadequate, as FG does, to juxtapose qualificational categories at specific levels, such as epistemic and deontic modality, time and quantificational aspect at the predicational layer. Each qualificational category appears to occupy a unique position vis-à-vis its immediate neighbors, and the system in general appears to involve a gradual scale, viz., for the dimensions discussed above, as in (289).

(289) evid. > epist.mod. > deont.mod. > time > quant.asp. > qualif.asp.

This list is obviously far from exhaustive and must be elaborated, first of all at the lower end, witness the remaining lower-level operator and satellite categories in the FG and RRG proposals. The considerable differences between these models in the types of and relations between qualifications at the lower end of the system indicate that accounting for those levels is far from a trivial operation. An interesting question is also how the bottom end of the layered system relates to the representation of the state of affairs. Is there a sharp cutoff point of the layered system, or does it fade gradually into the representation of dimensions of the state of affairs? And does the system remain strongly hierarchical or does it flatten at the lower end, such that it becomes more and more difficult to see hierarchical relations between qualificational dimensions? The list in (289) may also be incomplete at the higher levels, however. For example, one may wonder whether there is a need for a category of emotional attitude, as expressed in adverbial elements such as *damned*, *the hell*, etc. and predicates such as *curse*, *damn*, *admire*, *regret*, etc. The dimension involved in these is in any case within the set of notions which can be descriptive as well as performative (cf. Nuyts 1990b). But maybe it can be considered part of or closely related to deontic modality, quite like the category of volition (cf. Palmer 1986: 116ff.) This points at yet another limitation of (289): not only deontic modality, but also several other qualificational categories are internally complex. For example, evidentiality is a cover term for a series of more or less divergent subcategories, including source evidentiality, (inter)subjectivity, and mirativity (DeLancey 1997), which may show mutual scope relations. Something similar may apply to lower-level qualifications: e.g., the difference between absolute and

relative indications of time and space.[40] Dealing with these issues is obviously beyond the scope of the present investigation.

6.6.2 *Stacks in layering and the status of interaction*

The foregoing does not necessarily imply that the introduction of 'stacks', as in FG, is completely misguided. One can perfectly imagine that the system, superimposed upon the gradual hierarchy in (289), shows groupings of qualificational categories in terms of shared semantic properties, which may trigger similar behavioral features. Thus, the explanation for cases (d)–(f) above suggests that deontic and epistemic modality and evidentiality do form a group. This is further supported by the observation in Section 6.5.3 that these three qualifications might actually share the special informational status observed for epistemic modality in particular, while lower-level ones do not, or not as strictly. The FG layered model (cf. Figure 8 in Section 6.3) suggests yet another intuitively plausible grouping in the lower range of the system, rendered in the definition of the predicate- vs. predication-level qualifications. Thus, there are qualifications which further specify the internal structure of the state of affairs: e.g. qualificational aspect, which concerns the state of development of the state of affairs. And there are such that situate the state of affairs in the world: e.g. temporal and spatial situation, and also quantificational aspect, which concerns the frequency of the state of affairs.

Unlike the latter division, however, the former is clearly not in line with the stacks proposed in FG: our account implies a 'caesura' between deontic modality and time, where there is none in FG. And what about the other divisions proposed in FG? The FG stacked system is motivated in terms of

40. At first sight, one might be tempted to consider epistemic modality more complex than has been presented so far, too. For there is also the linguistic category which in the literature has been called realis vs. irrealis, which is not very prominent (though certainly not absent) in West Germanic, but is very manifest in many other languages of the world (cf., e.g., Givón 1994, 1995: 111ff; Chafe 1995; Mithun 1995), and which, like expressions of degrees of likelihood, is clearly concerned with the epistemic status of the state of affairs. However, this category can be taken to go back to the same epistemic scale as expressions of likelihood, but to express another dimension of it, viz. (roughly) whether the state of affairs as expressed in the utterance is conceptually marked for epistemic certainty or not. Obviously, investigating this linguistic category may throw interesting additional light on the conceptual structure of epistemic modality, but it need not lead to a split in the conceptual category as such.

general functional principles, and this raises the macrolevel question of the deeper rationale behind the layered system. In Section 6.6.3 below I will address this issue in positive terms. But let me first take a critical look at the FG proposal, since this brings up a few interesting issues related to the layered system.

Firstly, the general arguments for the stacked system in FG (cf. Hengeveld 1988, 1989, 1990) are problematic (cf. also Nuyts 1992a, b), especially if applied at the conceptual and not at the linguistic level. As mentioned in Section 6.3, the main division in a representational and an interpersonal layer is argued to render two dimensions of an utterance, viz. its status as a narrated event (or better: a narration event) and as a speech event. According to Hengeveld this corresponds to two major functions of an utterance: designating a state of affairs at the representational level, i.e. Bühler's (1934) 'Darstellungsfunktion', and representing a potential fact as the content of a speech act at the interpersonal level, i.e. Halliday's (1976) 'interpersonal function'.

But the distinction between designating a state of affairs and representing a potential fact is puzzling. Would one not assume that a potential fact **is** a state of affairs, and vice versa, hence that representing a potential fact in a speech act **is** designating a state of affairs, and vice versa? Also, a conceptual structure is obviously neither a narrated nor a speech event. It is just a coding of derivations from percepts (states of affairs), including a marking of their status (qualifications). So applying an interpersonal vs. representational distinction characterizing linguistic action in the system of conceptual layering is begging the question: a conceptual system, including the layered system (in a way — see below), just represents.[41] To illustrate this directly in terms of qualifications (cf. Figure 8 in Section 6.3): it is hard to see why deontic modality, i.e. whether a speaker likes or dislikes something,

41. Also at the linguistic level, however, this link between levels and function categories is disputable. First of all, the cluster 'representational + interpersonal' will not do as a typology of functions of language (see Nuyts 1992b: 26–64, 1993b). And secondly, as argued in several places above, there is no simple match between function categories and structural dimensions. The linguistic expression of any qualificational category involves an element of representation (of the conceptual qualification) and an element of adaptation to the interlocutors' concerns (the way the conceptual qualification is represented in function of the mutual positions — the intentions, relative social roles, etc. — of the speaker and the hearer in the communicative context).

or considers it good or bad, or desirable or necessary, would be representational, concerning the designation of a state of affairs, while an evidential category such as inference would be interpersonal, involving the representation of a potential fact in a speech act. Both just participate in the conceptual representation of reality, no more or no less.[42]

In line with this, it is probably not adequate to introduce illocutionary force in the layered system at the conceptual level. Both FG and RRG do fully integrate it in their treatment of qualifications. In as far as they intend to cover the behavior of linguistic forms, this is justified since speech act markers clearly interact with and have properties comparable to expression devices for qualifications. But, as suggested in the overview of FPG in Section 6.2 (cf. Figure 6), illocutionary force is probably not a conceptual category at all. Illocution is certainly not a qualification of a state of affairs: it is a matter of the speaker's plans and intentions with his/her utterance vis-à-vis the hearer in the actual communicative situation, in relation to his/her deeper intentions with respect to the world (as represented in conceptualization). Thus, unlike qualificational notions which assess the position of a state of affairs in the world, illocutionary force is only relevant in connection with the process of producing linguistic expressions in an actual communicative situation. It is, in fact, a major element driving this process.

This is not to deny that illocution is related in very profound ways to the conceptual system, and even to certain qualificational dimensions there, viz., probably not accidentally, the high-level ones. Thus, illocution shares with these qualifications the matter of performativity. As argued in Section 1.4, what is performed in the two is a quite different thing, viz. a conceptual operation vs. a linguistic act. Nevertheless, the 'performing entity' is no doubt the same in both (cf. Section 6.6.4 below).

The sources of illocutionary force and the deeper intentions behind them are no doubt conceptual, too, and also in this respect there are links with

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42. Surely, both have a social dimension to them as well. What is good or bad is to a considerable extent socially determined (and acquired by an individual through socialization). And what can count as a valid inference is so as well. But in that way, everything conceptual is social or interpersonal. What one considers (too) fast or slow, or (too) large or small, is considerably determined by societal norms as well, yet aspectual categories — assuming qualifications of manner are such — are clearly very low in the layering system. Mind is a thoroughly social phenomenon, but that observation helps little to structure the layered system.

qualificational categories. Information questions are generated by gaps or unclarities in conceptual knowledge, i.e. essentially by epistemic uncertainty, and the intention to fill or resolve them. And orders or requests for action, or promises, are probably generated by a combined epistemic assessment of the (non)existence and a deontic assessment of the (un)desirability and/or (in)necessity of a state of affairs, and the intention to do something about this. This no doubt explains why illocutionary markers and deontic and epistemic markers are often closely related, witness the borrowing links between them (cf. Section 6.5.1). And it explains our repeated observation (cf. Sections 2.3, 3.3 and 4.3) that performative epistemic expressions do not occur in questions, or if they do, that they lose their epistemic status and become speech act modifiers. The same seems to apply in orders, so real epistemic markers are probably limited to declarative contexts. In case of an informational gap or unclarity, a speaker has two options, depending on his/her goals and/or expectations vis-à-vis the hearer, e.g. in terms of whether the latter can fill the gap. Either (s)he can communicate his/her own view, with an epistemic assessment, of how it might be filled or resolved, leading to a declarative with an epistemic expression. Or (s)he can ask the hearer to fill or resolve it, leading to a question thematizing the gap or unclarity as such. But then, there is no use for an epistemic expression. In fact, if there is such an expression in other than a speech act-modifying function, then this is automatically part of the thematized gap, hence descriptive (cf. the arguments in Sections 2.3, 3.3 and 4.3).

An even more complex issue, which at least to some extent taps into the distinction between interactional and conceptual dimensions, is how to deal with conditional, temporal or causal relations, relations of purpose, reason, motivation, etc. in utterances. FG fully integrates these in the layered system, viz. in satellites at the predicational, propositional and illocutionary levels (cf. Figure 8 in Section 6.3). But conceptually, these dimensions are obviously quite different from ordinary qualifications of states of affairs: they concern relations between states of affairs. Thus, even as satellites they usually take the form of full subordinate clauses. But the same links exist between syntactically independent clauses, so these relations extend beyond the domain of a single utterance. How such relations get expressed, then, is very much a discursive or interactional issue, i.e. of how the speaker organizes his/her discourse in view of his/her communicative purposes and the position of the hearer. In terms of FPG, these are matters of the organization of the

situational network and the linearization of information in singular states of affairs (cf. Section 6.2).

Still, it is quite obvious that such clause connections do tap into basic conceptual dimensions, and thereby do relate to the hierarchy of qualifications, though probably in very complex ways. E.g., temporal connections are unavoidably based on the temporal situation of each of the related states of affairs. Or consider conditionals. As observed in Sections 2.3, 3.3 and 4.3, performative epistemic expressions do not occur in a conditional protasis. This can probably be explained similarly as the absence of performative epistemic forms in questions. Conditionals are a complex and quite divergent category, and going into details is beyond the present scope (see, e.g., Akatsuka 1985; Traugott et al. eds. 1986; Dik 1990). Still, the following may essentially apply to all types. In the protasis, a speaker brings up a hypothesis about how some conceptual gap might get filled. But (s)he is not conjecturing how (s)he expects the gap will be filled. In that case an epistemic assessment would be to the point. Rather, (s)he is stipulating one possible way the gap might be filled, with the aim to point out which consequences that might have, irrespective of its probability. Hence, there is no use for an epistemic expression here. This analysis does show, however, that conditionals have an intimate link with the domain of epistemic qualification.

This relation between qualifications and clausal links at once explains why there are so many diachronic and synchronic connections between qualificational and discourse markers, as observed e.g. by Traugott and colleagues (cf. the discussion of borrowing in Section 6.5.1). Maybe we have even witnessed how such a connection comes about ourselves. As argued in Section 6.5.4, in a way the strategically used modal auxiliary also signals the status of its clause relative to what follows, viz. as a concessive. This reveals how concessives relate to epistemic modality. In that light, it would not be surprising to find that the modal starts developing features of, and ultimately will get reinterpreted as a concessive discourse marker. It is also understandable why such diachronic developments do fit the pattern of continuing subjectification, as Traugott calls it, i.e. of climbing up the ladder of the qualificational hierarchy: they do so by virtue of the relation of discourse markers to qualifications in the layered system. The details of how combining states of affairs in relation to the layered system works are beyond the present scope, however.

6.6.3 *The rationale behind the layered system*

The motivation for the organization of the layered system in FG appears not watertight. But then, what could be the rationale behind the principle of layering? It is not difficult to find one, which at once accounts for the gradual nature of the system as rendered in (289), and for the stacking in it suggested in the previous Section. The elements of this account are even implicitly or subliminally contained in, or at least very closely approached by, the FG account.

The gradual broadening of scope involved in the cline appears to correlate with a gradual widening of the perspective on the state of affairs. Specifically, the qualifications in the cline develop from, at the lower end, clarifications or further specifications of aspects of, i.e. internal to, the state of affairs, to, at the higher end, assessments of the status of the state of affairs. Correspondingly, qualifications low in the system require no or hardly any information other than knowledge of the state of affairs itself, while qualifications high in the system are predominantly or exclusively based on information external to the state of affairs.[43]

The caesuras postulated between deontic modality and time and between quantificational and qualificational aspect do not bring in another logic: their characterization above shows that they perfectly fit into the same rationale. This means that they do not constitute radical breaks, for, as indicated, the rationale does involve graduality. Consider the qualifications in between the two caesuras. Quantificational aspect does not change the properties of the state of affairs as such, but nevertheless it still draws fairly closely on those internal properties, since it requires a comparative checking of whether there is identity between instances of a potentially recurrent state of affairs. Temporal and spatial qualification, however, involve a specification of or situation in the external dimensions of time and space of a state of affairs,

43. As mentioned in Section 1.3a, epistemic, deontic and dynamic modality have sometimes been characterized as relating a state of affairs to three different types of domains of knowledge. To the extent that this is meant to involve domains of external knowledge, this is no doubt fully adequate for deontic and epistemic modality (and probably for a few other qualificational dimensions as well), but much less so for dynamic modality: deontic and epistemic modality involve relating a state of affairs to knowledge which is entirely external to the information about the state of affairs proper, while dynamic modality involves a characterization of an observable feature internal to the state of affairs itself.

and for that purpose the internal structure of the state of affairs matters much less. In the upper stack, deontic modality in a way still situates the state of affairs, viz. in the social world and its moral values, without putting its reality status as such at issue (the state of affairs can either be real or non-real: cf. *it is a good thing that you did that* vs. *you should do that soon*). Epistemic modality, however, does not situate the state of affairs anymore, but puts its reality status at issue, thereby in a way broaching the question whether it needs to be situated at all. So it looks like the caesuras in the layered system are little more than somewhat more drastic qualitative jumps culminating from an accumulating number of smaller jumps underneath them.

This rationale behind the layered system also offers a natural account for the different scope of qualificational categories over domains of the qualified state of affairs. Both FG and RRG deal with this issue by relating qualifications to different hierarchical levels in clause structure (the nucleus or predicate, the core or predication, etc. — see Section 6.3). As suggested in Section 6.5.2, however, this kind of construction is probably equally superfluous in syntax as is the semantic hierarchy of qualifications itself. For it follows directly from the layered system at the conceptual level. Obviously, if low-level qualifications further clarify or specify aspects of the internal structure of the state of affairs, they will directly affect the relation between the participants in the state of affairs. Since this relation usually gets expressed as the predicate in a linguistic expression, they appear to be predicate modifiers. If medium-level qualifications situate the state of affairs as a whole, they affect not only the relation between the participants, but also the participants themselves. So in linguistic expression they will usually appear to affect the predicate plus the core participants, plus the expressions of the low-level qualifications, of course. Finally, high-level committing qualifications affect whatever there is about the state of affairs, including its external situation, so it is only normal that their expressions will usually also affect the situating operators and satellites.[44]

All these statements about linguistic expression are relativized by the labels ‘usually’ or ‘normally’. In fact, the situation need not be as described.

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44. To what extent this means that an $\bar{X}$-style syntax of the type introduced by Jackendoff (1977) and also adopted in some form in RRG is completely superfluous is a discussion for another occasion.

As observed in Sections 2.4, 3.4 and 4.4, epistemic expressions sometimes only affect some small subpart of an utterance, often a backgrounded or parenthetical one. The FPG approach allows for a straightforward account of this fact. Depending on how the speaker, in view of the communicative circumstances, decides to organize the information in the situational network and/or in the singular state of affairs (see Section 6.2), epistemically (or otherwise) qualified relations in conceptualization can get linguistically coded, not in the main pattern of an utterance, but in some subdomain (a noun, a parenthetical, etc.).[45] In such cases, then, the qualificational expression can hardly be considered to be attached to — in the epistemic case, and in RRG terms — the clause node in syntax. This observation offers another good reason to consider the extension of scope over domains of the state of affairs a matter of the layered system in conceptualization, and not in syntax.

The rationale behind the layered system can be related, at least roughly, to an even more basic dimension of human cognition, viz. the tension between perception and interpretation. Climbing up the ladder of the system in a way involves a decreasing role of direct perception of the state of affairs, and an increasing role for interpretation and creative involvement on the part of the speaker. (This construal of the system obviously gives full significance to Traugott's 1989, 1995 notion of subjectification.) In principle, the basic level of the conceptual representation of the state of affairs is closest to, i.e. has been acquired through or should be accessible for direct perception of the world. Any instance of perception is obviously necessarily local, restricted to what is within the direct reach of the perceptive system (whichever it is) at one point in time. The higher one climbs up in the hierarchy, the more the qualifications appear concerned with specifying aspects of this state of affairs which are beyond the locality of immediate

45. As a matter of fact, most or all qualificational dimensions which we have encountered at the sentence level (in main or subordinate domains) are also expressible within the noun phrase (cf. the level of the term operators in FG — see Section 6.3b). And qualificational expressions at that level appear at least roughly subject to the same organizational principles as those at the sentence level, microstructurally (i.e., their ordering being determined by semantic scope — cf. Rijkhoff 1990) and macrostructurally (in terms of the general rationale behind the organization; cf. Clark and Clark 1977: 474). Though going into this is beyond the present scope, one may expect that exactly the same layered system can be seen at work at the two levels of organization.

perception, and are thus dependent on, or aim at, abstraction and generalization, and/or on perceptions or information outside the state of affairs proper.

For example, quantificational aspect requires repeated perceptions of states of affairs and a generalization over them, e.g. in terms of the uniqueness of one perceived state of affairs relative to others, or the similarity of different perceived states of affairs such that this 'type' of state of affairs can be characterized as so and so frequent, or as generic, etc. (This issue clearly leads into the important problem of knowledge of tokens vs. types, see Section 6.4.) Situation in space requires linking the perception of a state of affairs to other (different) perceptions in going to or from that state of affairs in space, and a generalization over them in terms of often abstract bounded areas. E.g., what counts as 'being in Paris' is far beyond immediate perception. Situation in time is similar but then involving the perception of natural cycles of the sun and the even more abstract estimation of numbers of such cycles using conventional, hence completely abstract, definitions of time (e.g., the calendar). And epistemic modality is not at all a matter of direct perception of a state of affairs anymore, but of abstract deductive reasoning from perceptions of other states of affairs, or generalizations over them, to the tentative postulation of a possible, hypothetical state of affairs.

The fact that the layered system relates to such a fundamental aspect of human cognition may then also explain its pervasive effect on linguistic development. As observed in Section 4.1, the ontogenesis of the different meanings of the modal auxiliaries largely follows one, cross-linguistically recurrent path, and this path turns out to correspond to climbing up the qualificational hierarchy. And this is not limited to the meaning acquisition of the modals: epistemic modality is a late acquisition quite in general (see, e.g., Hickmann et al. 1993). Similarly, as observed in several places (cf. Sections 4.1c and 6.5.1), the diachronic evolution of qualificational expressions in general also clearly follows the cline in the layered system. At least for acquisition, the explanation for the correlation is obvious. If the cline involves increasing reliance on information external to the state of affairs proper and increasing abstractness and generalization, then the higher in the cline the more complex are the processes involved in determining the status of the state of affairs, i.e. in issuing the qualification at stake. And, presumably, higher complexity correlates with greater acquisitional difficulty, hence later acquisition. For diachronic evolution this explanation is less evident: why should processing complexity in an individual mind correlate with order

of long-term development in a linguistic community? Yet in the biological world evolution also appears to involve a gradual development of increasingly complex organisms. So it is tempting to assume that even for diachrony there is something to the matter of the complexity of the qualificational categories, even if it is not immediately apparent in which way.

6.6.4 *Commitment and control*

Our analyses of epistemic modality and our construal of the layered system appear to hold at least one further implication for our concept of the architecture of the human cognitive system. If epistemic modality and other qualificational categories involve or result from a meta-operation over a state of affairs, what performs this meta-operation? Surely it does not just happen all by itself, automatically. If climbing up the qualificational hierarchy involves an increasing role for creative involvement of the subject, what causes that involvement? More specifically, if epistemic modality and the other high-level qualifications involve a concern with types of speaker commitment to the state of affairs, and can be expressed with or without speaker commitment to the qualification itself (the performativity vs. descriptivity issue), where does that element of commitment come from? The speaker, of course — but what in the speaker? All these issues point in the direction of a concept which has a long tradition in AI (see, e.g., Hayes-Roth 1985), but which apparently, in some form, must be assumed in cognitive theories of natural intelligence as well. They all suggest the existence of a 'control unit' which steers, coordinates and supervises at least some of the operations of the cognitive system. This unit is not explicitly represented in the outline of FPG in Section 6.2, but it may be taken to stand closest to the element of intention in Figure 6: human intentionality probably directly emanates from it.

Such a control unit is not needed for epistemic modality and the layered system alone.[46] It is probably a quite crucial ingredient in the cognitive apparatus in general, operating in some way and to some extent in each and

46. Apart from the elements to be discussed below, there are also plenty of mundane linguistic phenomena — also beyond epistemic modality and other qualificational categories — which appear to presuppose the existence of this control unit, as I have argued in Nuyts (1992b).

every component of the linguistic (or any other cognitive) system. Thus, the existence of a control unit is implied, even if rarely made explicit, in the debates regarding the controlled vs. automatic nature of cognitive processes in cognitive and language psychology (cf., e.g., Schneider and Shiffrin 1977; Shiffrin and Schneider 1977; Levelt 1989). These debates are far from settled. There is a wide consensus that low-level processing in perception and behavior (linguistic and other) is more automatic and high-level processing, especially reasoning and thought, is more controlled. But there is no consensus at all about where or how the borders between the two are to be drawn. This issue is obviously quite directly related to the debate about the degree of interactivity and flexibility of processing: presumably, the more interactive and flexible, the more controlled processes are. If so, then the interpretation of our findings in this regards in Section 6.5.5 strongly points towards a considerable role for the control unit even in syntactic and prosodic processing.

Control in processing is probably a gradient phenomenon though. The central control unit can be taken to head a complex, hierarchically organized control system, which also includes lower-level control mechanisms, sometimes called 'demons'. The latter may exist, e.g., for each component in the language system, and even for subsystems within those components. The activities of such lower-level mechanisms may at least sometimes and to some extent be supervised and coordinated by the central control unit. Such a concept leaves room for degrees of semicontrolled processing. Also, which processes are controlled and which automatic need by no means be constant. Thus, while most phonological and phonetic processing is no doubt default automatic, one can easily imagine situations in which there is at least some level of control over it, e.g. when forcing articulation. In general, in view of the 'superimposed' or 'cultural' nature of language as compared to other perceptual and behavioral systems (see Section 1.2a), one can reasonably assume that the role of control in it is more considerable than in those other, more basic systems. (See Nuyts 1992b for a more elaborate discussion of several of these issues.)

But the role of the central control unit is no doubt especially important in conceptual processing, i.e. in the universe of interpretation in FPG. High-level performative qualifications of states of affairs in particular, such as epistemic evaluations, may be taken to reflect its operations quite directly. These qualifications probably result from the control system's evaluative

comparison of the chunk of knowledge object to the qualification to other knowledge stored in the universe of interpretation or derived from the actual situation. Thus, several dimensions of epistemic modal and similar qualifications can be related to what are presumably basic features of the central control unit. Consider the following.

– The central control unit can first of all be assumed to incorporate or to trigger the experience of the speaker's 'self', whatever that means in terms of the 'technical' features of the unit (see, e.g., Baars 1988 on the 'self-system'). As such, it creates or gives sense to a concept of subjectivity, and of intersubjectivity, so the existence of the qualificational dimension of (inter)subjectivity can be directly related to this. The same reasoning applies for the closely related dimension of mirativity, or surprise (see Section 1.4). Likewise, the unit lends meaning to the concept of 'personal commitment' which is so central to the high-level qualificational dimensions, or to illocution for that matter.
– Closely intertwined with the foregoing, it is reasonable to assume that the central control unit is the locus of consciousness. Consciousness is of course a highly complex, volatile and hardly understood phenomenon, despite increasing attention to it in cognitive psychology and the philosophy of mind (cf., e.g., Baars 1988; Dennett 1991; Ellis 1995), and even in language research (cf. Jackendoff 1987, 1996; Chafe 1994, 1996). As Natsoulas (1983) points out, there is considerable confusion even over the precise definition of the concept. So whatever we say about it is highly tentative. Still, one need not agree with Jackendoff's (1987, 1996) claim that only peripheral cognitive phenomena are accessible to consciousness (in his view, in the domain of language only phonological structure is). One intuitively does have awareness of the quality and cohesion of things, including the syntactic structure of linguistic utterances, and the conceptual meaning of linguistic and other structures. And awareness is consciousness. Specifically, introspection suggests that one is well aware when issuing a high-level qualification such as an epistemic modal one. Even more radically, awareness of the self, or self-awareness of the central control unit, would seem criterial for concepts such as subjectivity or commitment. One can agree with Jackendoff that one cannot be conscious of processes but only of their products: e.g., there is no way to become aware of the operations performed while

epistemically evaluating a state of affairs. On the other hand, his claim that consciousness is nonefficate in that it does not affect or influence computation, which boils down to considering it a mere epiphenomenon of computational processes, is hardly credible: e.g., awareness of problems in understanding the world may no doubt trigger hypothesis-building, hence epistemic modal evaluations. Jackendoff contrasts his what he calls 'intermediate-level theory of consciousness' to otherwise quite generally accepted 'central-level theories'. But the question is whether we do not need a 'global theory', in which consciousness is directly linked to the operation of the control system, and can thus be related to the results of different levels of processing. Developing this is for another occasion, however.[47]

– Another notion well known in cognitive psychology which can be directly related to the central control unit is attention. This notion is critical for the argument developed in Section 6.6.1 regarding the limited processing capacity affecting high-level qualifications. In the literature on controlled vs. automatic processing it is commonly assumed that automatic processes can run in parallel (hence are fast), while controlled processes must be executed one at a time and serially (hence are slow). Attention is a, or the, key factor in this: controlled processes require attention from the central control unit, and attention is a limiting element in the sense that one normally cannot pay attention to more than one thing at a time. Hence, if performing the high-level qualifications involves an operation by the central control unit directly, it is natural that one can only perform one of them at a time. The one thing which can be in attention need actually not be simple: attention probably has a center and a periphery. Thus, we may assume that attention is also a critical element in information-structural focus: the focus in an utterance is the

47. In a way, Jackendoff's view is understandable. Somehow it is true that one can get a good mental picture of how an utterance sounds, while this is not so for syntactic or conceptual structure. But this then probably involves an acoustic phonetic representation, and not phonological structure, as Jackendoff assumes. And the reason is probably that this phonetic structure still carries the vividness of one's direct percepts of the physical world, while levels further removed from the perceptive input lack this feature. Moreover, what would seem involved in this observation is 'imagery of perception': intuitively, when producing an utterance one does not get a better awareness of phonological (or even articulatory phonetic) structure than of syntactic or semantic structure at all.

focus of attention of the control system. But then our observation about the special information-structural position of the epistemic qualification (see Section 6.5.3) implies that, unless it acquires contrastive focus, not the epistemic evaluation as such but the hypothetical state of affairs is the center of attention. That is, the focus of attention is on hypothesizing (an aspect of) a state of affairs, and estimating the degree of probability of that hypothesized element is in the periphery of attention. Actually, consciousness too has been argued to have a focus and a periphery or fringe (cf., e.g., Baars 1993; Mangan 1993; Chafe 1994). This raises the question to what extent consciousness and attention are overlapping phenomena. It is usually assumed that they are not identical (cf., e.g., Jackendoff 1987; Baars 1988) and intuitively this is correct, even if there is no doubt an intimate link between the two. Alternatively, the question is whether there is a confusion of properties of attention and consciousness. The third possibility is that consciousness and attention do indeed share this property. This is food for further thought.

In this context, the distinction between performative and descriptive uses of qualificational expressions such as epistemic ones, which has figured so manifestly in our investigation, can now be formulated in more theoretical terms. As argued, performative expressions linguistically render the conceptual output of operations of the central control unit directly. But, as suggested in Section 1.4, descriptive, commitment-less expressions do not result from an operation of the control system, but rather render qualifications which have somehow become represented and stored as part of the speaker's knowledge of the world. The situation is less simple than it might appear at first sight, though: the distinction cannot simply be grasped in terms of an opposition between an operation and a stored representation. For, as indicated in Section 6.4, the origins of a performative qualification may be an operation over a state of affairs, but this operation obviously results in a conceptual metarepresentation which can from then on be considered part of the representation of the state of affairs, even if it does not represent a state of affairs. It is the resulting conceptual metarepresentation which is rendered by linguistic expressions of the qualification. Thus, if, as suggested above in line with Jackendoff, awareness can only access representational output of processes but not processes themselves, and if a qualification such as epistemic modality is within the range of awareness, then the object of one's

awareness must obviously be a representation of that qualification.

Directly relevant to this matter is the question whether for each state of affairs in conceptual knowledge all qualificational dimensions in the layered system must be present and set for a certain value or not. In line with Chafe's (1994: 129) adage that "consciousness cannot function without being oriented in space, time, society, and ongoing background events", the answer is probably positive. One can reasonably assume that knowledge about events and objects is not fully anchored in one's conceptual system until all dimensions of its status are clear, and that, if some of those dimensions are not clear, the control system will strive to resolve the gaps as soon as possible. And this probably not only means knowing how it relates to other conceptual information, its frequency, its spatial and temporal situation, etc. One no doubt also aims to assess its social value and, in function of the former or not, one probably automatically develops a degree of (dis)like for it (deontic modality, broadly defined). And one certainly needs to know about its reality status (epistemic modality), and about how one got to know about it (evidentiality).

If this is adequate, one cannot but assume that the outcome of qualificational operations can also be stored long-term, just like the knowledge of the states of affairs they affect. What really differentiates performative and descriptive qualifications, or more generally qualifications with vs. without speaker commitment, then, is this. The former, after having been executed, remain 'validated', i.e. they remain coded within the layered system, and this is probably the case as long as the speaker is not forced to reassess them. This does not apply to the latter. Descriptive qualifications involving the speaker's own former views originally involved validated qualifications in the layered system, which have become invalidated by information acquired later. But for some reason they have not simply been erased from memory, but have gotten stored as knowledge about one's former ideas. Maybe our conceptual system even does some kind of bookkeeping of former views, at least in some important cases. But, going on our empirical data in Chapters 2–4, such cases are all in all very rare, or are at least rarely talked about. Descriptive qualifications involving another speaker's views, on the other hand, are purely acquired through perception, either because one has been informed about them, or because one has inferred them from other observations. So they immediately enter the conceptual system as knowledge about facts in the world, or, in other words, as a representation of a state of affairs.

This does not necessarily mean that, as part of one's conceptual representation of the world, descriptive qualifications are not distinguished from the facts about the world which they qualify. Maybe they do maintain a special status as meta-level notions, for knowing about their metarepresentational status is obviously necessarily part of one's knowledge about them. (Cf. also Section 6.5.3 regarding descriptive qualifications and information structure.) So in conceptual structure they may form a sort of intermediate level between the representation of the state of affairs proper and the hierarchy of qualifications with speaker commitment. But they are in any case fully subject to the latter, as is obvious from the fact that in linguistic expression they can be affected by any qualification in the layered system with speaker commitment. A descriptive epistemic qualification can be qualified by the speaker for aspect, time, deontic modality, epistemic modality, etc. This perspective invites interesting questions such as: Is the intermediate descriptive level, when it involves more than one qualification for a specific state of affairs, also hierarchical, or is it looser? (Surely, the assumption that all qualifications must be present does not apply to it.) And what principles (if any) apply thereby? And is there any kind of special interaction between the descriptive and the performative qualifications? These are issues for further analysis.

Of course, if for any state of affairs all performative qualifications are always conceptually represented, one may wonder how this squares with our argument earlier in this section that the high-level qualifications are severely restricted in their ability to co-occur because of processing limitations. The former claim implies that evidentiality, epistemic modality and deontic modality are all three conceptually represented for each state of affairs. So once performed and stored, why should there be any processing load involved if those qualifications are addressed in a linguistic expression at a later time? Probably, the critical point is again that these three dimensions involve an explicit concern of the speaker with his/her commitment to the state of affairs. Presumably, bringing up one's commitment, of any type, to a state of affairs in a discourse implies that the status of the state of affairs in this regard is not obvious, e.g. because the hearer turns out to hold a different view, or because there is otherwise new information relevant for one's view. If so, this means that each time one does so, one is forced to recalculate one's view, irrespective of what one had stored on the basis of

earlier assessments. Hence the argument regarding the limited processing capacity, due to limitations of attention, remains valid.

Thus, in the specific case of epistemic modality, one may reasonably assume that normally a state of affairs stored long-term in the universe of interpretation is certain knowledge. That is, the epistemic slot in the layered system over it is set for certainty. So its epistemic status is not an issue at all and is not brought up, at least not by the speaker, when talking about the state of affairs. When knowledge is epistemically less than certain however, it is no doubt inherently unstable, and the speaker will keep trying to resolve the uncertainty. This means that (s)he keeps on processing information potentially relevant to the state of affairs, thereby epistemically reassessing it. One may actually wonder whether uncertain information is normally stored for more than a short to intermediary period of time at all. Similarly, one may wonder whether clearly counterfactual information, i.e. marked for ‘certainty that not’, makes it into the long-term store of world knowledge, except for rare, highly significant cases, such as ‘that job of a lifetime which one did not get’. (These cases are obviously not to be confused, even if there are obvious links, with the issue of bookkeeping of one’s former views as discussed above.)

6.6.5 *Conceptual relativity*

So much for our — in many respects quite tentative and highly incomplete — attempt at an answer to the question how to conceive of the layered system and the position of epistemic modality in it, at the conceptual level. To round off the discussion, let us turn to the issue of universality once more. As suggested in Section 6.5.6, one can reasonably assume that the layered system, including the precise set of qualifications involved in it and their ordering, is a universal feature of the human conceptual system. In how far this assumption can really be maintained remains to be seen in further research, of course. For the matter is thoroughly empirical. Strict Whorfians would no doubt feel inclined to question it, in view of the enormous diversity in what languages of the world do with qualificational expressions (see Section 6.5). Yet one consequence of our discussion of the relationship between linguistic and conceptual structure is that variability in the former does not necessarily mean much regarding the latter. Each language offers one possible solution to a functional problem space called communication,

and in view of the high complexity of this functional space and of the versatility of language structure, the number of possible solutions is probably very high. But this problem space is specific to language and other communication systems, and is not shared by the conceptual system. However, the present investigation also goes to show that languages **do** reveal conceptual dimensions, for rendering conceptualization is part of the communicative problem space. Hence variability between languages **can** be significant in this regards. The critical point is, however, that one needs a global perspective on the variation. A study only of, e.g., grammatical expressions of qualifications will not do, for variability in that range alone does not allow valid conclusions at all. One needs a global view of all expression types for any semantic dimension, i.e., a paradigmatic perspective of the kind used here, for any relevant qualificational category, in a significant sample of languages of the world. As long as that has not been achieved, no valid empirical conclusions are possible.

However, in view of the very fundamental nature of the dimensions involved, it would really be surprising to find that there are humans who do not, for instance, differentiate between stages of development of states of affairs (as involved in qualificational aspectual dimensions in language), or situate states of affairs in time and space, or think about them in terms of good and bad or liking and disliking (as involved in deontic modal expressions), or concern themselves with the veridicality or with the sources of their knowledge about states of affairs, irrespective of their cultural or social backgrounds.

This does in no way imply a universalist view of conceptualization: there is no principled reason why cultural and social background may not determine how qualificational dimensions actually get realized and function in the conceptual system. One very well documented illustration is the divergence in how people of the world conceptualize space. As is elaborately shown by Levinson (1996a, 1996b, 1997) and colleagues, spatial terminology in typologically divergent languages reflects a few fundamentally different ways to carve up or organize space, and this most probably reflects fundamentally different ways in which the speakers of those languages think about space. Of course, in view of its three-dimensional nature space leaves much more room for profoundly different ways of conceptualizing it than a one-dimensional scale such as the epistemic one (or most other qualificational dimensions). But that does not mean that even in such a case, cultures cannot differ, e.g. in terms of how fine-grained positions distinguished on

the scale can be. Thus, the languages we have considered have basic terminology, in the range of the adverbs and adjectives, for 5 major positions on the scale (in the other expression types, the divisions are rougher — see Section 6.1). But by further modifying these through grading expressions, or even by quantifying the degree of likelihood (*there is a 95% chance that* …), speakers of these languages can go very far in detailing positions on the epistemic scale. There is no reason, however, why other cultures would necessarily have to go equally far in this. How was the situation in North-western Europe before statistics was invented and educated people started to understand how to quantify probabilities?

The fact that humans potentially **can** think — i.e. conceptualize — certain things in certain ways in no way implies that they **do** think in those ways. No doubt, speakers of Tzeltal could in principle conceptualize space the way speakers of Dutch do, and vice versa. The reasons why they do not are no doubt complex. But part of the story is probably that their physical environment has features which make one kind of conceptualization more adequate than another in view of their functioning within that environment. Another, complementary part of the story is limits to the way our knowledge is or can be generalizing. As argued in Section 6.5.3, conceptualization must be discourse-context-free: it has to function across, hence must generalize over specific interactive situations. Yet this is obviously constrained by occurring or imaginable variation: knowledge can only generalize over the really occurring or imaginable range of contexts or context types. But for most humans in most cultures, especially during their years of development and acquisition, when their conceptual system is molded, variation basically only involves microcontexts, i.e. immediate discourse contexts which people frequently face. Macrocontexts such as culture and social class do not tend to change frequently for most people. Hence, no doubt, these macrocontexts heavily determine the way humans conceptualize their world.

This view obviously implies that, even though what **can** be conceptualized must be innately determined, what is actually conceptualized depends on the needs and interactions of the organism in/with its physical environment. No need for inborn Maggie Thatchers or Voyagers to Mars, as Fodor (1975) would have them. Conceptualization is as — or even more — heavily functional or adaptive as/than any other part of the human cognitive system, including the linguistic system. But the functionality of the conceptual system is quite different from that of the linguistic system. Whence its different nature.

Conclusion

The aim of this monograph has been twofold. (i) One aim was to perform a paradigmatic investigation of the functional and structural properties, and their interrelations, of 4 major epistemic modal expression types in three West Germanic languages. And (ii) its purpose was to use this investigation to add to our understanding of the cognitive infrastructure for language use, and specifically to inquire into the nature of and the relationship between linguistic structure and processing and conceptual structure and processing. The background of it all was a cognitive-pragmatic concept of modeling language.

Hopefully, I have managed to show, on the one hand, how important it is even for a methodologically traditional functional linguistic analysis of a classical linguistic problem such as the present to look beyond the narrow limits of language per se into its wider cognitive context. In order to grasp the complexities of the facts of language, it is essential to take actively into account the way linguistic structure relates to conceptual structure, and to take serious the dynamic processual character of language, and of cognition in general. ‘Depth’ and ‘dynamism’ are crucial ingredients for linguistic analysis.

On the other hand, I hope to have shown how taking such a perspective allows us to learn more, not only about linguistic structure and processing per se, but even about human conceptualization, despite the fact that the latter is hidden behind the former. As argued in Chapter 1, one of the major problems in our concern with how language relates to conceptualization is to find out ways to distinguish between what is linguistic and what is conceptual in our observations about language. Obviously, the choice of an adequate method is essential for this. Our paradigmatic approach, involving a narrow focus on one semantic category (though without neglecting its interrelations with other, neighboring semantic dimensions) and a wide focus on its

linguistic manifestations, in combination with our radically functionalist perspective, appears to have been a good instrument for this.

Obviously, the present analysis, of the semantic domain of epistemic modality, and even more so of the structure of the cognitive systems involved in language use, is in many respects incomplete and tentative. Many dimensions are in need of further investigation and elaboration. In the course of the discussion I have tried to turn this limitation into a virtue, by signaling many open questions and suggesting ideas which may generate further research. Hopefully, this investigation will thus be a useful source for further thought and a good starting point for new investigations which — far beyond the present, small contribution — may take us further on the long and winding road towards an understanding of human cognition, and the role of language in it.

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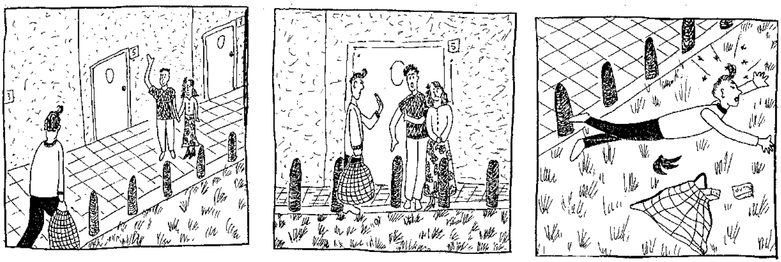
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Appendix 1

Cartoon strips and their experimental conditions

1.



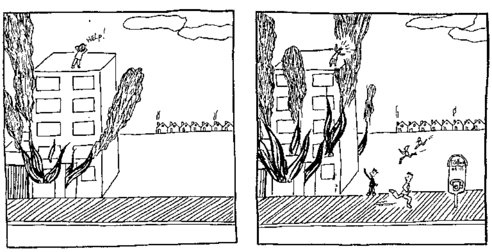
FS: Question: *why is Paul lying on the ground?*

FQ: Explan.: L: *Paul is lying on the ground because he got involved in a quarrel and got hit*

U: *Paul is lying on the ground because he stumbled over a post*

Question: *what is your opinion of this explanation?*

2.



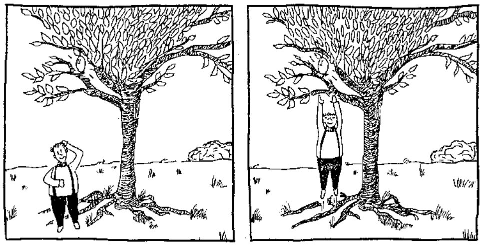
OQ: Question: *does the man jump off the roof?*

OS: Outcome: L: *the man does not jump off the roof*

U: *the man does jump off the roof*

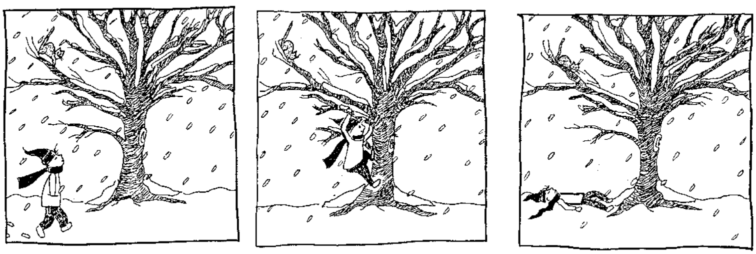
Question: *why does he (not) jump?*

3.



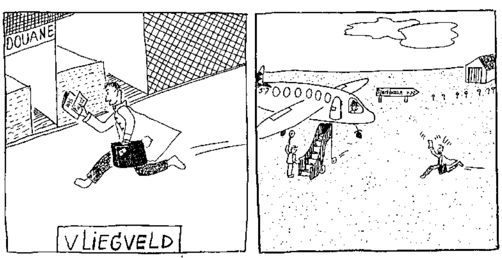
OQ: Question: *does Gert manage to pick the plum?*
OS: Outcome: L: *Gert does manage to pick the plum*
U: *Gert does not manage to pick the plum*
Question: *why does he (not) manage?*

4.



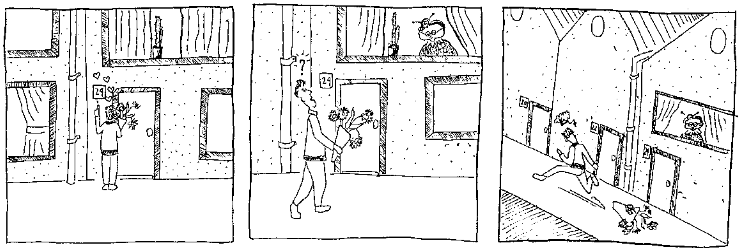
FS: Question: *why does Keesje fall out of the tree?*
FQ: Explan.: L: *Keesje falls out of the tree because the branches are icy*
U: *Keesje falls out of the tree because he is a poor climber*
Question: *what is your opinion of this explanation?*

5.



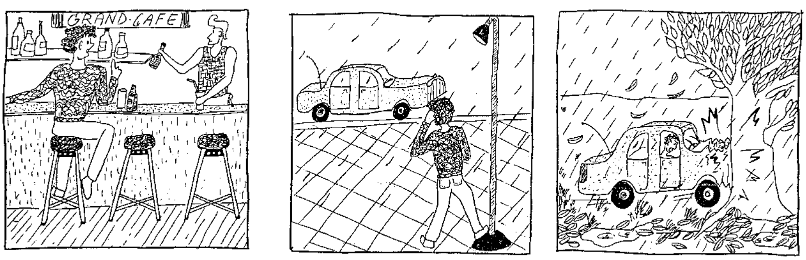
OQ: Question: *does Jaap manage to catch the plane?*
OS: Outcome: L: *Jaap does not manage to catch the plane*
U: *Jaap does manage to catch the plane*
Question: *why does he (not) make it?*

6.



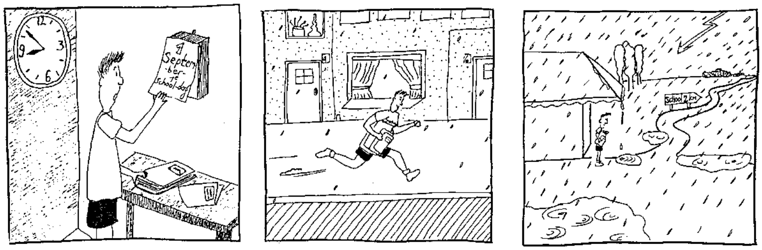
FS: Question: *why does Hans run away?*
FQ: Explan.: L: *Hans runs away because his girlfriend's mother, who does not like him, has seen him*
U: *Hans runs away because his 'blind-date' disappoints him*
Question: *what is your opinion of this explanation?*

7.



FS: Question: *why does the boy have a car accident?*
FQ: Explan.: L: *the boy has a car accident because he is drunk*
U: *the boy has a car accident because the road is slippery*
Question: *what is your opinion of this explanation?*

8.



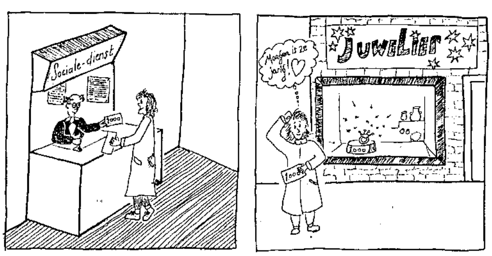
OQ: Question: *does Jan run on to school?*
OS: Outcome: L: *Jan does run on to school*
U: *Jan does not run on to school*
Question: *why does he (not)?*

9.



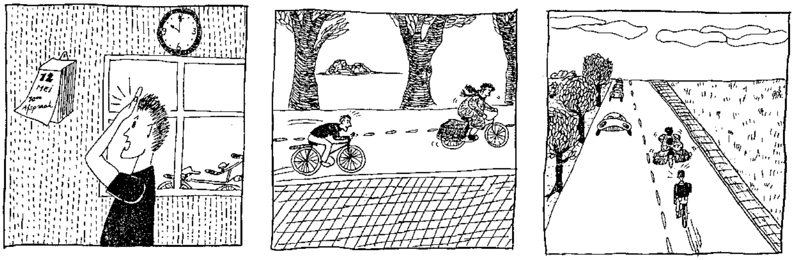
FS: Question: *why does Eric break his leg?*
FQ: Explan.: L: *Eric breaks his leg because he is a poor skier*
U: *Eric breaks his leg because the storm made him lose his balance*
Question: *what is your opinion of this explanation?*

10.



OQ: Question: *does Koos buy the ring?*
OS: Outcome: L: *Koos does not buy the ring*
U: *Koos does buy the ring*
Question: *why does he (not)?*

11.



OQ: Question: *does Maarten pass the woman?*

OS: Outcome: L: *Maarten does not pass the woman*

U: *Maarten does pass the woman*

Question: *why does he (not)?*

12.



FS: Question: *why does the stunned boy sit handcuffed in the police station?*

FQ: Explan.: L: *the boy sits handcuffed in the police station because the police officer is mistaken about who is the robber*

U: *the boy sits handcuffed in the police station because he has stolen something, too*

Question: *what is your opinion of this explanation?*

Appendix 2

Qualificational expressions in the experimental data

1 = *Wordtype*/lemma; 2 = Semantic category: e(pistemic)/o(ther); 3 = Number of occurrences in spoken direct answers; 4 = Number of occurrences in written direct answers

1	**2**	**3**	**4**
Sentence adverbs			
Blijkbaar	o	12	2
Duidelijk	o	1	1
Eventueel	o	3	0
Kennelijk	o	4	1
Misschien	e	30	15
Ongetwijfeld	e	1	0
Vast	e	1	3
Waarschijnlijk	e	54	23
Wellicht	e	0	1
Zeker	e	5	5
Predicative adjectives			
Aannemelijk	e	8	5
Duidelijk	o	2	0
Logisch	o	8	16
Mogelijk	e	6	8
Onlogisch	o	0	1
Onwaarschijnlijk	e	0	1
Plausibel	o	1	5
Waarschijnlijk	e	8	2

1	**2**	**3**	**4**
Term adjectives			
Aannemelijk	e	3	1
Acceptabel	o	0	1
Logisch	o	16	15
Mogelijk	e	0	1
Onlogisch	o	1	0
Onwaarschijnlijk	e	0	1
Plausibel	o	3	1
Waarschijnlijk	e	1	2
Modal auxiliaries			
Kunnen	e	63	27
Moeten	e	3	3
Zullen	e	67	56

1	**2**	**3**	**4**
Mental state predicates + similar predicates			
Aannemen	e	3	1
Denken	e	256	29
Geloven	e	5	3
Uitsluiten	e	0	1
Verwachten	e	1	0
Vinden	o	23	8
Voor de hand liggen	o	0	2
Weten	e	6	0
Particles			
Toch	e	7	1
Wel	e	98	21
Nouns			
Kans	e	3	2
Evidential predicates			
Blijken	o	1	2
Lijken	o	43	23
Idioms			
In ieder geval	e	10	1
Mijns inziens	o	0	1
Naar mijn idee	o	1	0
Naar mijn mening	o	1	0
Volgens mij	o	13	3
Voor de hand liggend	o	1	1

Subject index

Name index

Word Index

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4. PANTHER, Klaus-Uwe and Günter RADDEN (eds.); *Metonymy in Language and Thought.* 1999.
5. NUYTS, Jan: *Epistemic Modality, Language, and Conceptualization. A cognitive-pragmatic perspective.* 2001.
6. FORTESCUE, Michael: *Pattern and Process. A Whiteheadian perspective on linguistics.* n.y.p.
7. SCHLESINGER, Izchak, Tamar KEREN-PORTNOY and Tamar PARUSH: *The Structure of Arguments.* n.y.p.
8. SANDERS, Ted, Joost SCHILPEROORD and Wilbert SPOOREN (eds.): *Text Representation. Linguistic and psycholinguistic aspects.* n.y.p.